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THE MADRAS

QUARTERLY JOURNAL

OF

MEDICAL SCIENCE.

EDITED BY

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PART I.
ORIGINAL ESSAYS.

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**ART. I.—***Observations on the Nature of the Food of the Inhabitants of Southern India, and on Prison Dietaries, in the Madras Presidency.* By W. R. CORNISH, Assistant Surgeon, Secretary to the Principal Inspector General, Medical Department.

[**INTRODUCTORY NOTE.**—In the year 1861, Dr. Monat read a paper before the British Association for the Advancement of Science, on the prison dietaries in Bengal, and the Secretaries of the Association made a requisition through the Secretary of State for India, that information regarding the nature of the food of the free population and of prisoners in jails, should be obtained and forwarded to the officials of the Society, from all parts of India. The Officers of the Madras Medical Establishment in civil employ having been called upon by the head of the department to afford their aid, a series of detailed and valuable reports were in due course received, to which I am greatly indebted for accurate information regarding the nature of the food used in the several districts. In forwarding these reports to Government, I was desired to give a general summary of their tenor, and to point out in what respects our prison dietaries appeared deficient. The following pages contain the substance of the report, already submitted to the Madras Government, printed and partially circulated; but a few additional remarks have been incorporated in the present reprint.]

I. THE FOOD AND DRINK OF THE PEOPLE.

**WITHIN** the geographical limits of the Madras Presidency, there are living several distinct races of people. The surface configuration of the land of the Peninsula, rising from the sea

Geographical features of the Presidency as influencing climate and natural productions of the soil.

level to altitudes of from 6,000 to 8,000 feet, gives a greater variety of climate than is usually found in tropical countries. The mean temperature at the sea level may be set down, approximatively, as from  $80^{\circ}$  to  $85^{\circ}$ ; on the table lands of Mysore and the Deccan, from  $70^{\circ}$  to  $75^{\circ}$ ; and on the Neilgherry plateau and other mountain ranges, from  $56^{\circ}$  to  $65^{\circ}$ .

The food of the population is as diversified as the geographical features of the country, and the influences of caste and race have tended still further to perpetuate distinctions in the kind and quality of substances used as food. The Hindoo, in whatever part of the country he may be living, has been usually regarded as a rice eater. The earlier impressions obtained by travellers with regard to the manners and customs of the country, arose from intercourse with the people living on the sea board, and as rice is one of the staple products, and the chief food of the people on the alluvial plains near the coasts of the Peninsula of India, it was erroneously assumed that the whole population of the country were rice eaters. The late Mr. Buckle,\* in his attempt to explain the influence of physical laws on the characteristics of nations, fell into the error of regarding the whole of the inhabitants of India as peculiarly rice eaters. He observes: "From the earliest period the most general food in India, has been rice, which is the most nutritive of all the cerealia." And from this erroneous statement of facts he goes on to argue:—

"Thus possible is it, by the application of a few physical laws, to anticipate what the natural food of a country will be, and therefore to anticipate a long train of ulterior consequences."

Mr. Buckle's hasty generalization in this matter arose from the assumption of two fundamental errors as proven facts. In the first place, rice does *not* occupy in India the position of bread to the English labourer, or of the potatoe to the Irish. It is not the *essential* article of diet to the millions of people who form the bulk of the population; and secondly, the assumption that rice is the most nutritive of all the cerealia is contradicted, not only by the experience of those who feed on it, but by scientific analysis of its component parts.

Rice is generally grown on the sea board, and in the allu-

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\* History of Civilization in England, Vol. I. page 181.

vial valleys of great rivers, but there are many districts in the interior where it forms but an unimportant item in the natural products of the country. Central India, the North West Provinces, Punjab, and Nagpore, produce more wheat than rice, and wheat flour (*Atah*) is there the principal food. In the Gangetic valley, in lower Bengal, and in Burmah, rice is extensively grown, and becomes one of the staple articles of food of the people, as well as a chief commodity of export. The sea-board of the Madras Presidency is generally rice-producing, but in the interior other cereals which require less moisture, and which can be grown without artificial irrigation, take the principal place in the dietary of the great bulk of the people. In the Mysore provinces and many of our Collectorates *raggy* (*Elusine Corocana*) is the grain most generally eaten, and perhaps it is the one most largely used in Southern India as the staple food of the labouring man. In nutritive power it is equal, if not superior to wheat, the great staple of northern countries, and hence perhaps its very general use, by those who have to endure bodily exertion in their daily life.\*

To determine the relative quantities of the dry grains and rice produced in this presidency, is by no means an easy task in the absence of statistical tables, showing the average yield of grain of the several districts. The Board of Revenue has obligingly furnished the following statement in illustration of the quantity of land under "wet," "dry," and "garden" cultivation—but this document alone, is not sufficient to give any definite idea, of the relative quantities of the several species of grain. It does not, in point of fact, show the actual amount of land under cultivation, but only such portions as the Government derives its yearly assessment from. Zemindaree and Inam lands, or freeholds, are not included in the figures. Rice is generally grown in "wet" land, but one species, the "black paddy," is sown on dry lands, and derives sufficient mois-

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\* Dr. Forbes Watson places this grain *below* rice as regards its nutritive value, but it seems probable that there is some error in his mode of calculating the proportion of nitrogen, or, what is very probable, he may have analysed a bazaar specimen which had been attacked and partially destroyed by insects, or fungi. There can be no doubt after Mr. Mayer's analysis, of the superiority of raggy to rice.

ture for its growth from the monsoon rains, without artificial irrigation. The sugar cane is grown on wet land. The "dry" cultivation includes not only grain, but oil seeds, cotton, indigo, &c., so that a knowledge of the gross average of land under cultivation, does not permit of any exact approximation to the quantity of food produced. The gross yield depends moreover so much upon the fertility of the soil, and the suitableness of the seasons, that the question becomes still more complicated, and a correct solution of it almost impossible. From a statement drawn up by the Director of Revenue Settlement, it seems that the average produce in one district of *cholum*, varies from 800 measures (about 2,400lbs.) per acre, to 134 measures (or 400lbs.) per acre, and that these variations depend upon the nature of the soil; while of irrigated paddy, the average product per acre varies according to soil from 1,200 measures to 400, or 3,600 to 1,200lbs.

If we allow  $1\frac{1}{2}$ lbs. of grain as the average daily consumption of an adult man, an acre of irrigated land will produce enough food to feed from three to seven persons for a whole year. An acre of dry cultivation with an average crop of raggy, cumboo, or *cholum*, will only at the same rate produce food enough for about half the number. In the Madras Presidency it may be roughly computed that there are twenty millions of acres of land, which undergo some sort of cultivation every year, and the population at the last census in 1861 was said to be rather more than twenty-four millions, so that practically, there is nearly an acre of arable land to each inhabitant. The variations in the relative yield of the several grains on different qualities of soil, are, however, so great, that it is impracticable to do more than give a guess at the proportions of rice and dry grains which are consumed. At a rough estimate it may be laid down that land which will produce by the natural moisture of the seasons, food enough for one man, will, under irrigation and a constant water supply, bring forth enough to feed three. On a large portion of wet land it must be borne in mind the water supply is insufficient for more than a single crop in the year.

The "Garden" lands are generally irrigated from wells, and being more highly cultivated, the produce is proportionally great. In these lands, tobacco, chillies, vegetables, &c., are principally grown, as also the dry cereals, in the seasons, when there is a deficiency of natural moisture.

To show the disproportion in the nature of the grains produced in the various districts, I have reduced the figures of the following table, to percentages, which give the relative proportions of each kind of cultivation in 100 acres of soil.

*Table showing the extent of land under cultivation in the Madras Presidency, during Fusli 1271.*

| DISTRICTS. |                | DRY.       | WET.      | GARDEN.  | TOTAL.     |
|------------|----------------|------------|-----------|----------|------------|
|            |                | Acres.     | Acres.    | Acres.   | Acres.     |
| 1          | Ganjam ...     | 89,166     | 1,61,061  | 2,054    | 2,52,281   |
| 2          | Visagapatam .  | 12,364     | 14,371    | 40       | 26,775     |
| 3          | Godavery ...   | 3,93,161   | 1,68,113  | 2,723    | 5,64,002   |
| 4          | Kistnah ...    | 13,06,970  | 1,52,611  | 10,355   | 14,69,936  |
| 5          | Nellore ...    | 3,96,886   | 1,06,492  | 21,840   | 5,25,218   |
| 6          | Cuddapah ...   | 9,85,223   | 78,414    | 45,174   | 11,08,816  |
| 7          | Bellary ...    | 21,29,894  | 1,46,891  | ...      | 22,76,785  |
| 8          | Kurnool ...    | 10,51,061  | 19,796    | 13,904   | 10,84,761  |
| 9          | Madras ...     | 1,10,653   | 2,13,555  | 2,067    | 3,26,275   |
| 10         | North Arcot..  | 3,89,703   | 1,82,784  | 21       | 5,72,508   |
| 11         | South Arcot..  | 7,43,077   | 2,65,165  | 3,711    | 10,11,953  |
| 12         | Tanjore ...    | 2,36,281   | 7,19,195  | 32,250   | 9,87,726   |
| 13         | Trichinopoly.. | 4,83,063   | 1,46,928  | 39,794   | 6,69,785   |
| 14         | Madura ...     | 4,64,630   | 1,10,946  | 27,929   | 6,03,505   |
| 15         | Tinnevely ...  | 10,43,802  | 1,77,913  | 17,134   | 12,38,849  |
| 16         | Coimbatore...  | 14,70,783  | 77,462    | 1,59,438 | 17,07,683  |
| 17         | Salem ...      | 9,17,234   | 61,078    | 14,935   | 9,93,297   |
| 18         | North Canara*  | ...        | ...       | ...      | ...        |
| 19         | South Canara*  | ...        | ...       | ...      | ...        |
| 20         | Malabar* ...   | ...        | ...       | ...      | ...        |
|            |                | 122,24,006 | 28,02,775 | 3,93,374 | 154,20,155 |

\* Particulars for these districts were not forthcoming.



Table exhibiting the proportions of dry, wet, and garden cultivation in the several Collectorates of the Madras Presidency, during Fusli 1271.

| Districts. |                 | Average amount of dry Cultivation. | Wet. Cultivation. | Garden. Cultivation. |
|------------|-----------------|------------------------------------|-------------------|----------------------|
| 1          | Ganjam...       | 35.3                               | 63.8              | .8                   |
| 2          | Vizagapatam...  | 46.1                               | 53.6              | .1                   |
| 3          | Godavery...     | 69.7                               | 29.8              | .4                   |
| 4          | Kistnah...      | 88.9                               | 10.3              | .7                   |
| 5          | Nellore...      | 75.5                               | 20.2              | 4.1                  |
| 6          | Cuddapah...     | 88.8                               | 7.0               | 4.                   |
| 7          | Bellary...      | 93.5                               | 6.4               | .....                |
| 8          | Kurnool...      | 96.8                               | 1.8               | 1.3                  |
| 9          | Madras...       | 33.9                               | 65.4              | .6                   |
| 10         | North Arcot...  | 68.                                | 31.9              | .....                |
| 11         | South Arcot...  | 73.4                               | 26.2              | .3                   |
| 12         | Tanjore...      | 23.9                               | 72.8              | 3.2                  |
| 13         | Trichinopoly... | 72.1                               | 21.9              | 5.9                  |
| 14         | Madura...       | 76.9                               | 18.3              | 4.6                  |
| 15         | Tinnevely...    | 84.2                               | 14.3              | 1.3                  |
| 16         | Coimbatore...   | 86.1                               | 4.5               | 9.3                  |
| 17         | Salem...        | 92.3                               | 6.1               | 1.5                  |
| Total...   |                 | 79.2                               | 18.1              | 2.5                  |

From these figures we obtain the remarkable fact that only *one-fifth* of the entire area of cultivated land in the districts named is devoted to the production of rice and sugar, the remaining *four-fifths* being used for the cultivation of the dry cereals, dholl, gram, cotton, oil seeds, &c.

In some districts, as in Cuddapah, Bellary, Kurnool, Tinnevely, and Salem, the proportion of wet cultivation is exceedingly low, thus showing that the great bulk of the food of the people must be derived from the dry grains. In Kurnool, for instance, the rice produced in the district cannot under any circumstances be more than sufficient to feed *ten per cent.* of the population, even supposing that one acre of wet land is equivalent to five of dry in food-producing power. The remaining *nine-tenths* of the people must therefore depend upon the dry grains for their staple food, or import rice from other districts. The districts on the Malabar Coast are not included in the return furnished by the Board of Revenue, as most of the land is freehold in those districts, but here it seems probable that the proportions indicated would be reversed.

With regard to the produce of the country, it must be remembered that the dry cereals are all for home consump-

tion, whereas a varying, but large quantity of rice is exported, and the quantities so exported would have to be taken into consideration, in calculating the proportion of persons in the rice-growing districts, who look to that grain for their principle article of food.\*

The following statements kindly furnished by the Board of Revenue, show the chief imports and exports of food for the two official years 1860-61, 1861-62. It will be observed that the importation of paddy and rice was greater in the latter year, and the exports smaller, showing that from a combination of causes, there was very little surplus grain over and above the quantity required for home consumption during the latter year.

*Statement of the Imports and Exports of the principal articles of Food in the Madras Presidency.*

| IMPORTS.       |                             |                            |           |  |  | 1860-61. | 1861-62. |
|----------------|-----------------------------|----------------------------|-----------|--|--|----------|----------|
| Grain.....     | Anoomooloo ...              | Species of gram<br>or dhol | Quarters. |  |  | 5        | 25       |
|                | Condaloo ...                |                            | "         |  |  | 11       | 11       |
|                | Dholl ...                   |                            | "         |  |  | 1,900    | 1,812    |
|                | Menoomooloo ...             |                            | "         |  |  | 1,365    | 3,432    |
|                | Paddy ...                   |                            | "         |  |  | 65,368   | 76,364   |
|                | Natcheny (Raggy) ...        |                            | "         |  |  | 473      | 473      |
|                | Peas ...                    |                            | "         |  |  | 3,044    | 5,656    |
|                | Pessaloo ...                |                            | "         |  |  | 113      | 296      |
|                | Rice ...                    |                            | "         |  |  | 47,199   | 1,50,114 |
|                | Senagooloo (Bengal Gram)... |                            | "         |  |  | 2,228    | 3,690    |
| Provisions.... | Wheat ...                   |                            | "         |  |  | 14,243   | 13,516   |
|                | Ghee... ..                  |                            | cwt.      |  |  | 187      | 319      |
| EXPORTS.       |                             |                            |           |  |  |          |          |
| Grain.....     | Anoomooloo... ..            |                            | Quarters. |  |  | 47       | 815      |
|                | Caramunloo...               |                            | "         |  |  | 1,016    | 836      |
|                | Condaloo ...                |                            | "         |  |  | 6,526    | 1,102    |
|                | Dholl...                    |                            | "         |  |  | 1,719    | 2,445    |
|                | Menoomooloo ...             |                            | "         |  |  | 513      | 2,210    |
|                | Paddy ...                   |                            | "         |  |  | 47,235   | 47,952   |
|                | Natcheny ...                |                            | "         |  |  | 54       | 108      |
|                | Peas ...                    |                            | "         |  |  | 1,736    | 994      |
|                | Pessaloo ...                |                            | "         |  |  | 1,592    | 2,986    |
|                | Rice ...                    |                            | "         |  |  | 5,99,556 | 3,41,283 |
| Provisions.... | Senagooloo ...              |                            | "         |  |  | 76,390   | 51,588   |
|                | Wheat ...                   |                            | "         |  |  | 9,248    | 9,767    |
|                | Ghee... ..                  |                            | cwt.      |  |  | 8,605    | 5,277    |

However food may vary in external characteristics, the frame of man requires essential ingredients to be supplied

\* I am informed by Mr. Huddleston, Secretary to the Board of Revenue, that from Malabar and Canara large quantities of fine rice are exported to the Persian Gulf and Coast of Arabia, and that a coarser kind of grain for home consumption is brought down from Mysore, as well as from Bengal and Bombay.

by its means. There must be material to repair the daily waste of tissue, and there must be a different order of material to support the respiratory functions, and the heat and vitality of the body. Nature has wisely provided in the vegetable and animal kingdoms,

Food generally adapted to the nature of the climate.

all things necessary to the sustenance of man. The country he

inhabits will, as a rule, be found to produce the food best adapted to the conditions in which he exists. In Northern Europe, barley and oats are the grains which flourish best. The wheat countries include much of middle and southern Europe, Central Asia, North America, and Northern India. Maize flourishes largely in Central and Southern America and Africa; rice in Japan, China, and India; and the millets are much used in the interior of Southern India. All the *cerealia* contain vegetable albumen, starch, and mineral ingredients, in varying proportion; those which are the richest in nitrogenous compounds, are, as a rule, the best adapted for the staple food of a people, and those who use such grains have all the elements of which their bodies are built up, contained in their chief article of diet.

As regards the labouring population of India, the great bulk of their food is furnished by the staple grain of the district in which they live. Ascending higher in the social scale, the variety of food is extended, and the dietary scale is as complex as that of the rich and luxurious of European nations.

The reports received from the various districts, show that the ordinary bill of fare of a well-

The poverty of the people of Southern India, the chief cause of their consuming so little animal food.

to-do Hindu or Mussulman includes a very great variety of dishes, for the composition of which the animal, vegetable, and mineral

kingdoms of Nature are laid under contribution. Although there are no people in India who are strict vegetarians in their diet, yet it may be truly said that there is no country of which we have any record, where there is a smaller proportion of animal food consumed by the people generally. The strict Brahmins and Rajpoots, who confine their demands upon the animal kingdom to the use of butter-milk, curds, and eggs,—who eat of nothing which in their estimation contains *life*, are but few in proportion to the Hindoos and Mahomedans who eat moderately, as their means will allow, of animal food in the shape of mutton, fish, poultry, butter,

milk, eggs, &c. These again are not a numerous class in comparison with the bulk of the poor, whose means will not permit of more than a scanty and irregular consumption of animal food to be used with the staple grain of their district; and so it happens that in the aggregate of the population, vegetable food bears a very high proportion to that derived from the animal kingdom.

*List of the principal food grains in Southern India.*  
*Natural order, Graminaceæ.*

| English names.                                             | Botanical names.   | Hindustanee names.   | Tamil names.           |
|------------------------------------------------------------|--------------------|----------------------|------------------------|
| Synonyms of principal food grains. — Nat. Ord. Graminaceæ. | Rice (several sp.) | Oryza Sativa ...     | Chawul ...             |
|                                                            | Raggy              | Elusine Corocana ... | Natchene Raggee.       |
|                                                            | Great Millet       | Sorghum Vulgare.     | Jawree ...             |
|                                                            | Spiked Millet      | Penicillaria spicata | Bajree ...             |
|                                                            | Italian Millet     | Panicum Italicum.    | Kalakangnee ...        |
|                                                            | Little Millet      | Panicum Miliaceum    | Sawee Chenna-waree ... |
|                                                            | Wheat              | Triticum Æstivum     | Gahoon ...             |
|                                                            | Barley             | Hordeum hexastichon  | Jow.                   |
|                                                            | Indian corn        | Zea Mays             | Mukka Jowaree.         |
|                                                            |                    |                      | Mukka Cholum.          |

These are the chief of the grain yielding grasses used as food, but there are some other species of millet grown, such as *Panicum Miliare*, and *P. Frumentaceum*. The Chinese sugar cane, lately introduced into Southern India, under the name of "*Imphee*," though as yet scarcely naturalised, may be reckoned as a food grain. It appears to be a variety only of *Sorghum* or Great Millet.

The sugar cane is largely cultivated and used as food in the raw state, as well as for the manufacture of sugar. The seeds of the bamboo (*Bambusa*) are also eaten in times of scarcity, in those districts where the plant abounds.

Next in order to the cereals, with regard to their importance in the dietary of the natives of India, come various plants of the natural order Leguminosæ; in fact, those of the population who eat sparingly of animal food are com-

Importance of Leguminous plants in the diet of the people who live on grain.

pelled by the stern necessities of their being, to seek in the plants of this family the amount of nitrogenous material, required to renew the waste of tissue constantly going on in their bodies. All the pulses, the peas, beans, gram, and dhol, contain a

large percentage (from 25 to 30) of vegetable albumen, or casein, besides a large proportion of inorganic constituents, and hence their great value as substitutes for animal food. The principal pulses are included in the following list.

*Natural order, Leguminosæ.*

| Common names.     | Botanical names.              | Hindustanee names. | Tamil names.    |
|-------------------|-------------------------------|--------------------|-----------------|
| Dholl .....       | <i>Cajanus Indicus</i> ...    | Toor Dhall ..      | Thovray purpoo. |
| Green Gram .....  | <i>Phaseolus Radiatus</i> .   | Hara Moong ...     | Putchu payroo.  |
| Black Gram ....   | ..... Mungo ...               | .....              | Ooloondoo.      |
| Cooltee .....     | <i>Dolichos Uniflorus</i> ... | Kooltee ...        | Kolloo.         |
| Lentil .....      | <i>Ervum Lens</i> ...         | Mussoor ...        | .....           |
| Bengal Gram ..... | <i>Cicer Arietinum</i> ..     | Chenna ...         | Cuddalay.       |
| Common Pea .....  | <i>Pisum Sativum</i> ...      | Buttamee ...       | .....           |

These substances enter largely into the composition of the vegetable curries, they are also made into thin cakes with pepper and assafoetida, which are fried in butter, and thus eaten. Those who do not use animal food consume from two to four ounces of dholl, or some other of the lentil tribe, per diem, in addition to the ordinary amount of cereal grain.

The animal foods used in Southern India do not differ materially from those of other countries. Of these, butter, butter-milk, and fresh curds are the most universally used by all classes. The wealthier the individual, the more ghee (clarified butter) and butter-milk he generally consumes. The religion of the Hindoos prohibits their eating beef, and the Mussulmans are equally forbidden the use of pork, but with these exceptions, the flesh of domesticated animals, and of the wild ruminants of the forest is generally eaten. The lower castes and Pariahs even devour horse-flesh, as well as the bodies of cattle which perish from disease.

Along the sea-board, fish of all kinds are used as food, and salted fish finds its way into the interior, being an article of considerable trade in most bazaars.

**Fish.**

It is a mistake to suppose that there are any people in India who are absolute vegetarians.

No absolute vegetarians in India. Many castes or sects of Hindoos will not eat *flesh*, but such people use butter milk and curds very liberally in their diet.

The tribes inhabiting the forests of Southern India live chiefly upon jungle produce, *e. g.*, large and small game, honey, fruits, and the starchy bulbs of various plants. They procure a little rice, salt, tobacco, and betel from the plains, in exchange for the horns, hides, honey, wax, &c., which accrue to them in the chase.

Dist of aboriginal tribes.

The flesh of domesticated animals in India is generally lean, and deficient in succulent juices. This arises from the fact that the feeding of cattle for human consumption is an art not at all understood or practised by the natives. They are wretched farmers as regards the care of their cattle, and except in the neighbourhood of a station occupied by European Troops, there is literally no demand for fatted live stock. From the neglect to secure proper fodder during the hot and dry period of the year when all vegetation is at a stand still, horned cattle get miserably thin, and often perish by thousands at this season from contagious epidemics. Indian cattle are not very cleanly in their habits of feeding. Buffaloes, cows, and sheep will eat human excrement and other offal, when their own natural food is scarce.

Meat generally of inferior quality in India.

There appears to be some reason for concluding that the flesh of the bazaar fowl or sheep, is at times not a bit more wholesome than that of the "unclean" animal par excellence. Excellent meat can be obtained by feeding animals with good grasses and grain; "gram fed" sheep turn into mutton of superior quality. The price of meat so improved however puts it out of the reach of all except the wealthy.

The *succulent vegetables and fruits* used as food, are extremely varied and numerous. In the vital economy, they supply essentially necessary materials to the blood, and they are very important in relation to the health of the people. A list of the more common of these will be found in an appendix. Green vegetables are chiefly used in curries. The ripe fruits are eaten raw to a great extent in their season. Lime juice enters into the composition of nearly all Indian dishes, and the preservative action of this vegetable acid on the fluids of the body, is probably very important, where the consumption of

Fruits and vegetables.

Vegetable acids important in a grain dietary.

large quantities of cereal grain is so common. The general use of the fruit of the tamarind in curries, affords also another instance of the craving of the body for sour things, amongst those who eat largely of a grain diet.

Many of the Indian fruits besides affording a grateful acid to the economy, are in themselves full of nutriment. The plantain, jack fruit, mangoe, custard apple, pine, and melon, are all instances of wholesome and nutritious food. The fruit of the custard apple, (*Anona squamosa*) which grows wild\* in the Hyderabad country, has in times of scarcity been the means of saving thousands of the population from starvation. The many uses of the cocoanut, the palmyra nut, date, &c., are so well known, that they need scarcely be referred to here, except to observe that whenever these palms are common to the soil, they contribute in a very important degree to the food of the population.

The sugars and starches, which abound in many portions of Southern India, play also a very prominent part in the diet of the people. Sugar is made not only from the cane, but from the inspissated juices of different varieties of palm. Sugar cane, in the districts where it grows, is eaten largely in a raw state. In the south of Tinnevely, the *jaggery*, or impure sugar obtained by boiling down the toddy of the palmyra tree, forms a very important item of the staple food. The higher classes both of Hindoos and Mahomedans eat largely of "sweetmeats," many of them very curiously composed, but the chief bases of these dainties are sugar, butter, almonds, and flour.

Arrowroot abounds on the Western Coast of the Madras Presidency, and in lower Bengal. Sago and tapioca are also used to some extent.

In allusion to food of this description, the extended culture of the potatoe in the Mysore provinces, and on the Neilgherry plateau, should not be passed over without notice. At Bangalore

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\* I have seen it stated in a botanical work, that this plant is not indigenous, but introduced from America, or the West Indies. If so, it has taken most kindly to the soil of the Deccan, for the jungles are full of it.

these tubers are largely used by the native population, and appear to be much relished. On the hills too they are consumed by the natives, and form an article of considerable traffic to the low country.

*Spices and condiments* do not appear to have much nutrient value in themselves, although they form a very marked feature in all Indian dietaries.

Spices and condiments, their use as food.

Without something to stimulate and excite the digestive organs, it seems probable that the vast amount of grain taken into the stomach every twenty-four hours could not be assimilated. The essential oils, or acrid resins, of the condiments of an Indian dietary, appear to have the effect of exciting a sufficient flow of gastric and salivary juices to soften the bulk of vegetable food, and thus help in its conversion into material fitted for the nutrition of the body.

Chillies, black pepper, coriander, cardamoms, turmeric, ginger, garlic, and onions, are used by the grain feeding population of India, in quantities which would astonish those who derive their sustenance from a less bulky but more nutritious diet. The natives of India are unequalled in the

Chatnies.

preparation of "chatnies," compositions of fresh fruits or vegetables, with onions, garlic, chillies, &c., and these often take the place of pickles in giving a zest to food. With the variously prepared chatnies and spiced curries, the native gives to the most tasteless food a piquant and appetizing flavour.

Such is a very brief account of the principal classes of substances used as solid food by

Diet of the people not so simple as represented.

the native population. It must be evident that with such a wide variety of animal and vegetable productions, the diet of the people is by no means so simple as has been represented.

The fruits of the earth are gathered in abundance, and but with little toil or labour. The varying climates of the several districts are marked by differences in the character of the vegetation. The food which is most plentiful in one district may be almost a foreign produce in another, but on



the whole, Nature has been wonderfully bountiful in bestowing her gifts, and all districts are supplied with a great variety of substances useful for the nutrition of man and beast.

The Malabar Coast has been alluded to by Dr. Cleveland as destitute in some degree of the requirements for supporting animal life, but the remark applies evidently to the difficulty experienced in the rearing of domesticated animals, such as the ox and sheep. The wild forests of the district are stocked with the larger beasts, which are in no sense inferior to the animals of the same class on the eastern side of the ghaut. In Malabar there is a difficulty in rearing sheep, and the breed of cattle is very small. The same thing occurs in Burmah and Straits Settlements, where all the sheep for the use of European troops have to be sent over from the Coromandel coast. The prolific fisheries on the Western Coast, however, compensate in a wonderful degree for the scarcity of animal food in the province.

#### DRINKS.

The most common drink of the people every where is plain water, but it is by no means the only fluid used to allay thirst. The water in which grain has been boiled, is also generally drunk with meals, either fresh, or after standing for some hours, and becoming acid by fermentation. "Pepper water," a kind of soup without meat, is another very common drink with meals; an infusion of ginger is not unfrequently used on the Western Coast.

Of late years, tea and coffee have been more largely consumed by the native population. In the districts where coffee is grown, there is a very large local consumption of that article. Native road side coffee shops are often met with. The local demand for coffee in this Presidency is extending every year, and bids fair to increase.

A really pure and wholesome drinking water is by no

means easy to procure in Southern India. The exceptions

Drinking water in India generally impure.

are to be found chiefly in the mountain ranges, where the supply is constantly welling up fresh and sweet from the hill-sides. The streams, as they descend to the plains, carry down much organic and alluvial matter in suspension, and the proportion of salts, from exposure to high temperature and rapid evaporation, increases as the waters approach the outlet to the sea. In many districts, the saline particles of the soil being dissolved, give a brackish and unpleasant taste to the water. Chlorides, and nitrates and sulphates of soluble salts often abound in undue proportion, while organic matter, in the shape of minute animal and vegetable organisms, are constantly present to an injurious extent. The use of impure water is probably one of the most common causes of the prevalence of malarious fevers, fluxes from the bowels, and guinea-worm, in the native population. In the town of Madras, which is supplied wholly from wells and tanks, there is a great difference in the amount of organic constituents in the well waters.

Some I have ascertained, by the simple test with the permanganate of potash, to hold double or treble the amount of organic matter which is contained in the better kinds. In the Coimbatore and Salem districts, the waters are generally disagreeably impregnated with nitrates. The purest water as regards organic matters, is found in the districts where it percolates through *laterite* soil. Next perhaps in purity are the waters from wells in granitic districts.

#### FERMENTED DRINKS.

Fermented and distilled liquors.

As a rule the natives of Southern India are not given to excess in the use of fermented drinks, or what is perhaps more correct, they do not to outward observers show the ordinary signs of excessive drinking.

With the wide-spread distribution of *toddy*-yielding palms, it is but natural that the use of that beverage in a simple and fermented condition, should be very prevalent amongst the great majority of the population. The art of distilling spirit from vegetable juices appears to be almost as old as man himself, and the inhabitants of India, from the earliest ages, have been adepts in the process. Many drink the fresh *toddy*, others use it

The use of palm juice very common.

just as fermentation is beginning, or when it has attained considerable intoxicating power, while many again prefer to indulge, as their means permit, in libations of country spirit, (arrack) distilled from toddy or rice. With the strict professors of religious observances, whether of the Hindoo or Mahomedan faith, the use of fermented liquors is considered wrong, and if indulged in at all by these people, they are drunk in secret, but the millions of the population are not deterred by any such scruples. The Natives of hilly or mountainous districts in the interior, are perhaps more addicted to spirit-drinking than the people of the plains. Drunkenness is a common vice amongst the Coorgs; and the Khonds and Bheels distil a fiery spirit from the flowers of the *bassia latifolia*, which is drunk in large quantities by those people. So cheap is it, that for the moderate sum of half an anna, a man can procure enough to thoroughly intoxicate himself.

The natives of the plains who have settled in the bazaars of our hill stations, drink freely of any fermented liquor they can get—of late years they have taken to *beer*, which is manufactured in a local brewery at Ootacamund. Drunkenness is very prevalent amongst the bazaar people and native servants at this station. In physical appearance and muscular power, however, the people seem to improve, after they have become accustomed to the change of climate. By all recent testimony, the use of spirituous liquors is becoming more general in the interior of the country, and in the Presidency and coast towns, where the intercourse with the people of foreign nations has been regular and constant, there can be no doubt that spirit drinking after the European fashion, has become a common vice with some members of the rising generation of natives. The following table shows the quantities of foreign spirits and wines imported into Madras, and the revenue derived from the licence to sell spirituous liquors, and will help to indicate in what degree the consumption of intoxicating drinks has increased of late years. Spirits have not been imported in quantities larger than can be accounted for by the increase of the European population subsequent to the mutiny in 1857. The importation of beer has slightly decreased, while the quantity of wine has slightly increased. The fact is Europeans who can afford to drink light wines do so in preference to beer, while the habit of drinking to excess of any liquor is fast going out of fashion.

*Table shewing the quantity and value of Foreign Liquors imported into the Madras Presidency during the last 15 years, arranged in quinquennial periods.*

|                          |               | Quantity.<br>Gallons. | Value.    |    |    |
|--------------------------|---------------|-----------------------|-----------|----|----|
|                          |               |                       | RS.       | A. | P. |
| From 1846-47 to 1850-51. | Wines.....    | 2,94,697              | 24,98,412 | 0  | 0  |
|                          | Spirits.....  | 2,04,140              | 8,69,807  | 0  | 0  |
|                          | Malt Liquors. | 15,96,917             | 14,40,300 | 0  | 0  |
|                          | Total.....    | 20,95,754             | 48,08,519 | 0  | 0  |
| From 1851-52 to 1855-56. | Wines.....    | 2,86,444              | 26,81,405 | 0  | 0  |
|                          | Spirits.....  | 1,94,650              | 7,67,613  | 0  | 0  |
|                          | Malt Liquors. | 27,95,400             | 19,35,384 | 0  | 0  |
|                          | Total.....    | 32,76,494             | 53,84,402 | 0  | 0  |
| From 1856-57 to 1860-61. | Wines.....    | 3,00,119              | 23,93,170 | 0  | 0  |
|                          | Spirits.....  | 2,10,274              | 13,57,961 | 0  | 0  |
|                          | Malt Liquors. | 27,19,898             | 24,98,450 | 0  | 0  |
|                          | Total.....    | 32,30,291             | 62,49,581 | 0  | 0  |

For the figures from which this table has been framed, I am indebted to the Collector of Sea Customs.

The Collector of Madras, in statement and letter appended, exhibits a steady increase in revenue under *abkarry* during the last ten years, and what occurs in this one collectorate, is going on more or less throughout India, as shown by the progressive increase of imperial revenue under this head.

The Honorable Mr. Ellis is probably right in saying, that the individual consumption of spirits in the town of Madras has remained very much as it was some years ago, though from the general increase of *abkarry* revenue in the provinces, it seems that the use of spirituous liquors is either becoming more common amongst the native population, or that the progressive increase of revenue is due to the suppression of illicit distillation, and perhaps this is the most rational explanation of the two. There is a large amount of collateral evidence to show that the European portion of the population do not drink the same large proportion of imported liquor they did fifteen or twenty years ago.

*Statement shewing the amount of revenue under Abkarry, for ten years, from July 1852 to June 1862, Zillah Madras.*

|                  | RS.       | A. | P. |
|------------------|-----------|----|----|
| Fasli 1262... .. | 6,65,441  | 3  | 3  |
| Do. 1263... ..   | 6,55,442  | 9  |    |
| Do. 1264... ..   | 6,29,876  | 3  |    |
| Do. 1265... ..   | 6,68,676  | 10 | 5  |
| Do. 1266... ..   | 7,45,511  | 9  | 0  |
| Do. 1267... ..   | 8,55,042  | 14 | 2  |
| Do. 1268... ..   | 8,60,208  | 1  | 8  |
| Do. 1269... ..   | 9,84,313  | 7  | 1  |
| Do. 1270... ..   | 10,51,396 | 15 | 1  |
| Do. 1271... ..   | 9,78,878  | 5  | 3  |
| Total... ..      | 80,94,787 | 14 | 9  |

N. B.—The Abkarry Revenue being reckoned from the 1st July to 30th June following, the Revenue is given fusliwar.

No. 168.

MADRAS COLLECTOR'S OFFICE,  
SAIDAPET, 29th May 1863.

From the Honorable R. S. ELLIS, C.B.,  
*Collector of Madras.*

To W. R. CORNISH, Esq.,  
*Secretary to the Principal Inspector General,  
Medical Department.*

SIR,

1. In reply to your letter of the 1st instant, I have the honor to forward a statement showing the abkarry collections during the last 10 fuslies commencing from fusly 1262 to fusly 1272.

2. The presence of the Railway has during the last few years increased the Abkarry Revenue, not only since the line was actually opened in 1856, but also while the line was forming, and while Stations and Workshops were under construction. The movement of Troops during and immediately after the Mutiny also caused an increase to the Revenue.

3. I do not, however, think that in Madras the increase of Revenue has been attended by increase of drunkenness, or by its usual concomitant crimes of violence.\* I would rather attribute this in-

\* According to my own observation the use of spirituous drinks by the natives does not excite them to deeds of lawlessness in the same way that Europeans are affected. Drink stupifies a native without producing the stage of cerebral excitement, which leads the drunken European into the commission of crime. This view of the question is supported in a very able article, "*Bacchus in India*," lately published in Cheeson and Woodhall's Miscellany. Lombay.

crease in Revenue to a greater concentration of the consumers of spirits, and to a more careful supervision of the Abkarry department, by which smuggling has been decreased. The native population has, as regards the individual consumption of spirits, remained very much "in statu quo" for the last few years.

#### OTHER INTOXICANTS.

It seems almost a necessity of his nature that man should indulge in the use of some form of nervine stimulant.

Wherever the human race exists, even in the most primitive and uncivilized condition, the art of producing intoxicants is known and practised in some form, however rude and barbarous. In India, a country boasting of an ancient civilization, the use of nervine stimulants has been coeval with its history. Opium, Indian hemp, and the betel nut of the areca palm, have been used by the people from time immemorial, and in more recent years, the tobacco plant has been cultivated throughout the length and breadth of the land. If the people generally take a less quantity of fermented drinks than do those of temperate zones, they certainly make up for the omission by the habitual use of opium, hemp, betel, and tobacco.

The effect of these articles in moderation, is probably rather beneficial than otherwise. Opium eating and *gunjah* smoking are both occasionally carried to excess, and the consequences, in injury to the nervous tissues of the body, are very similar to those resulting from the excessive use of ardent spirits. The moderate use of all these agents appears to prevent undue waste of tissue in the body, and to render the frame less susceptible to the action of those impalpable but pestiferous poisons, which are so prevalent in the soil and atmosphere of tropical countries. The craving for the use of these things undoubtedly arises out of some urgent necessity in man's nature.

If one particular form of stimulant falls into desuetude, it is replaced by another. Years ago, when drunkenness was the prevailing vice of even the upper ranks in England, tobacco smoking was thought to be low and vulgar, but as the habit of drinking to excess fell into disrepute, so did the use of tobacco become more popular, until in the present day the proportion of men who use

tobacco in some form probably very greatly exceeds the number of those who do not. Excess in the use of tobacco is not only less hazardous to life, but is also much less frequent than the abuse of alcoholic stimulants, and the change therefore from alcohol to tobacco, as a national stimulant and sedative, is to be regarded as an advance in the right direction. It has been stated on good authority, that in English towns where the "total abstinence" movement has been largely followed by the labouring classes, there has been a corresponding increase in the sale of opium. It is not very long since, that one of the leading apostles of teetotalism was openly accused by a rival of indulging in the practice of opium eating; whether the charge in that particular instance were true or not, there is no question, but that there is an innate craving in the human constitution for something which has the effect of calming and soothing the nervous centres. These portions of the human frame are more and more called upon for exertion in the countries where civilization is progressing with giant strides, and it does not seem very probable that the views of those enthusiasts who decry the use of intoxicants, are likely to have any sensible effect upon the future conduct of the human race.

It would be well perhaps if reformers would content themselves with teaching and practising *temperance*, seeking to prove the wisdom of using all God's good gifts instead of abusing them; more good might be done in this way than by wasting energy, in attempting to show that Nature is a fool, and the craving for nervine stimulants merely the promptings of an evil Fiend.

The appetite for stimulants, as a late writer\* has truly observed, is one "which like the other faculties is given to different men in different proportions, and is subject like them to the organic laws. It grows with use, and lessens with disuse. It can be inherited and transmitted. Moderately indulged in, it is sanatorily and socially a blessing; immoderately, it becomes a curse to its victim, and a social pest."

Some authorities have attempted to trace a connection between the food of a nation and the national appetite for stimulants. It has been asserted that in countries where the *starchy* food predominates, the craving for stimulants is in

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\* Dr. B. Bird, *Indian Annals*, No. 16, page 498.

excess, and the instances of the Scotch who live on oatmeal, and the Irish on potatoes, have been adduced to account for the national predilection of those people for whiskey. So too it may be noted that the blubber-eating people of the Arctic seas have no relish for alcohol, and the general testimony of Arctic voyagers goes to show, that alcoholic stimulants are positively hurtful in those regions, whereas the appetite for *hydrocarbons* in the shape of *fat* and *oil* is wonderfully increased.

In India, where the starchy foods predominate, the national love of stimulants is exemplified rather in the universal consumption of betel, tobacco, opium, and hemp, than in a general proclivity towards the use of fermented drinks.

## II. THE PHILOSOPHY OF FOOD.

Before proceeding to consider the effects of different articles of food on the physical and mental condition of the native population, it may be as well to state briefly what food is, and what we know regarding its uses in the animal economy. A consideration of this subject is necessary to make clear the subsequent observations on the insufficiency of prison dietaries in the Madras Presidency.

All substances used as food are capable of being resolved into the four elements, carbon, hydrogen, oxygen, and nitrogen, in combination with certain mineral ingredients. Whether the food be derived from the animal or vegetable kingdom does not matter in the least, so long as it contains these elementary substances in due proportion. The ultimate elements and the proximate principles of food are nearly alike in both the animal and vegetable kingdoms. If we have albumen and fibrine in a leg of mutton, and casein in cheese, we find almost exactly the same substances in the cereal grains, and in peas, beans, and lentils. The proximate chemical principles required for the nutriment and development of man are—

### Chemistry of food.

Proximate principles. the albuminous, the saccharine or starchy, the fatty, and the mineral. No food is complete which does not include a proper portion of all these. The albuminous principles are found in both the animal and vegetable kingdoms. They are composed of carbon, hydrogen, oxygen, and nitrogen, in combination with phosphorus or sulphur.

### Albuminous matter.



It is to these albuminous principles that we look for the material to build up and repair the waste of muscle, sinew, and nerve. They are also termed *nitrogenous* or *azotised*, in contradistinction to the class of food which is destitute of nitrogen, and therefore incapable of conversion into flesh.

The *non-nitrogenous* principles however enter very largely into all composite foods, whether vegetable or animal. They include starches, gums, sugars, fats, oils, vegetable acids, and probably alcohol,\* and the purpose they serve in the animal economy is to afford fuel, as it were, for the production of animal heat, by their union with the oxygen of the atmosphere during the process of respiration. It is highly probable that all *non-nitrogenous* food which is assimilated, is converted by the mysterious chemistry of the body into fat, before it is used in the production of animal heat, and as a supporter of respiration.

If these principles of food are eaten in excess, and the respiration is not proportionately increased by active exercise, solid fat is formed in excess and laid up in the tissues. The use of fats and oils in food tends to produce obesity. Brahmins and wealthy Hindoos who eat largely of *ghee* and take but little exercise are familiar examples of the fact just noticed. The mineral substances which are necessary to the body are various, but the most important of them are salts of lime, sodium, potassium, and iron. All food must contain these three great principles, the nitrogenous, the fatty or starchy, and the mineral, with water as a diluent. Experiment has proved that if either be absent life cannot long exist.

The amount of food required for the sustenance of the body depends upon several surrounding conditions, and especially upon climate, and the amount of physical exertion which the individual undergoes. In northern latitudes where the temperature is low and the atmosphere dense, large quantities of what is called respira-

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\* Modern physiological research has tended to throw some doubt upon the old notion that alcohol is capable of supplying the place of carboniferous food. I cannot regard the recent experiments as a conclusive settlement of this vexed question.

tory food (the fatty or starchy principles) are required to supply the waste occasioned by breathing an increased supply of oxygen.

In tropical countries, where the air is heated and rarefied, and where each inhalation contains a diminished supply of oxygen, less food is required. So the man who undergoes severe bodily exercise in the open air, has his respiration increased, and takes into his system more oxygen than one who sits all day at a desk, and whose breathing is never hurried. The former will require more food than the latter, for the reason that the waste and molecular changes in his various organs, go on with greater rapidity while he is working hard.

Severe mental application induces waste of cerebral and of nervous tissues, and those who work hard with their brains, require a large supply of nourishing albuminous food, rich in phosphate to maintain their mental vigour, equally with those who engage in pursuits which demand mere bodily exertion.

It has been calculated that a laborer who engages in active bodily exercise, requires at the least 35 ounces of dry nutritious food per diem, and that soundness of health cannot be kept up for any length of time under thirty ounces. This in fact is the smallest modicum of solid food which can be given to a prisoner condemned to hard labor.

Under trial prisoners, or persons who take no active exercise may subsist upon less.

In addition to the solid food, a considerable quantity of fluid is required as a diluent; whether this is taken in the form of succulent fruits and vegetables, or as pure water, milk, tea, coffee, &c., it is calculated that the quantity of mixed solid and fluid food required daily is about seven pounds, and that five of these will be water. Within the tropics, these proportions may be slightly varied, but from the information now collected with regard to the quantity of solid food a labouring man will eat when he has the chance, it seems probable that the allowance of thirty-five ounces is rather below

Mental work exhaustive, and requiring nourishing food to replace waste of cerebral tissue.

Hard labor requires about 35 ounces of solid food per diem.

Of mixed solid and fluid, about seven pounds daily required.

the mark. To estimate the amount of food which the body

Professor Bennett's estimate of the daily amount of excreta from a healthy man.

consumes, the excretions of healthy men have been repeatedly examined, and the following *résumé* of the subject by Professor Bennett\*

gives the latest and most accurate observations we possess:—

“Of carbonic acid there are given off about two pounds or seven cubic feet, of which an ounce and a half may be separated by the skin; of water there is about six pounds separated, one-half by the urine and fæces, and the other half by the lungs and skin. The urine contains ten times as much as the fæces, and the skin gives off twice as much as the lungs, or somewhat more.

“As it is calculated that only five pounds pass into the body mixed with the food, the extra pound is supposed to be formed in the system by the union of oxygen with hydrogen in the proportion to form water. Of urea an ounce is separated daily in the urine of an adult man, together with eight or ten grains of uric acid. It is by these substances, which contain about fifty per cent. of nitrogen, that the azote which enters the body is almost altogether separated from it. The earthy salts pass out in minute quantity dissolved in the sweat, and are given off more largely by the urine, which contains daily four drams and a half of chloride of sodium, four drams of sulphate soda and potash, two drams of acid phosphate of soda, and one dram of phosphate of lime and magnesia. In the fæces, another four or six drams of mineral matter may be passed daily. the chief portion of which is derived from the residue of the food. Besides the substances named, a certain quantity of fatty, coloring, extractive, and other matters is excreted, the amount of which has not been yet estimated.”†

We thus see from the daily waste of the body, that all the kinds of food, the albuminous, the carboniferous, and the inorganic salts, are consumed and used up at a rapid rate. If the quantity of food, or the proportions of the three great classes be insufficient to compensate for this normal waste and disintegration of tissue, then disease and death speedily ensue.

Although chemists can find no appreciable difference in the constitution of albumen, fibrine, and casein of animal or vegetable tissue, yet it is certain that there are some variations which at present are beyond their power to explain.

\* Dr. J. H. Bennett's Lecture on Molecular Physiology, Pathology and Therapeutics, and their application to the treatment of disease.—*Lancet*, March 7th, 1863.

† Bennett, Op. Cit.

As Professor Bennett truly remarks, it has not been explained to us why the *carnivora* reject vegetable, and the *graminivora* refuse animal food, or why the substances which contain the least nutritious matter for one class of creatures are the chief means of support for others. Instinct seems to guide animals aright in the choice of food only so long as they remain in a wild state. The lion and tiger live upon the flesh of their prey, but the domesticated dog and cat will eat and assimilate nutriment from vegetable as well as animal food. Man, however, above all other creatures, has the faculty of deriving his food and nutriment both from the animal and vegetable kingdoms. In infancy, he finds his nourishment in Nature's simplest and

Milk the type of a perfect food. most perfect type of food, milk, which contains in due proportions every principle necessary to the

growth and development of the human body. But as the child develops in strength, and begins to shift for himself, his diet is adapted to the conditions of life which surround him. In the Arctic regions, where vegetation is scanty, he feeds principally upon animal fare. The fat and blubber of the seal or walrus supply the place of the starch and sugar of the vegetable world. In the tropics, where the fruits of the earth are brought forth in abundance, the staple food is derived from the vegetable kingdom. In the temperate regions, where the balance between animal and vegetable life is more equally maintained, both kingdoms contribute pretty equally to furnish a variety and profusion of food.

The whole tenor of the reports of medical officers, goes to show that the food of the Indian population is not of that simple character which has been usually supposed. There is as great a variety in the diet of the Indian labourer as of the industrious poor in other countries, and the craving for change and variety is as intuitive a faculty of Man within the zones of the tropics as in temperate climes. In concluding this part of the subject, I may quote the eloquent words of a writer in the *Cornhill Magazine*,\* expressing what our requirements are in the way of food:—

“Food must contain not material only, but power; that from which life is to flow must embody the results of living action. It must be redolent of sunshine, and permeated with light; it must

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\* Food—What it is.—*Cornhill Magazine*, vol. III., page 472.

have drunk in the virtues of the airs of heaven. For all these, our food must transfer to us, to glow within our veins, and animate our nerves. Through it, the forces of the universe must work within us, in order that we may live; and therefore, surely, it is that not to one or two, or twenty varieties of food, does nature stint our appetites or confine our feast. She opens her hand, and pours forth to man the treasures of every land and every sea, because she would give to him a wide and vigorous life participant of all variety. For him the corn fields wave their golden grain of delicate wheat, or hardier rye, of strengthening oat, or thinner rice, or oil abounding maize. Freely for him the palm, the date, the banana, the bread-fruit tree, the pine, spread out a harvest on the air, and pleasant apple, plum, or peach, solicit his ready hand. Beneath his feet lie stored the starch of the potatoe, the gluten of the turnip, the sugar of the beet, while all the intermediate space is rich with juicy herbs.

"Nature bids him eat and be merry, adding to his feast the solid flesh of bird, and beast, and fish, prepared as victims for the sacrifice; firm muscle to make strong the arm of toil in the industrious temperate zone; and massive ribs of fat to kindle inward fire for the sad dwellers under Arctic skies."

### III. DIETARIES OF THE LABOURING POOR AND PRISONERS CONTRASTED.

In the following table, I have set down the nature of the food of the free population and of prisoners in jail in the several districts, and I have further shown the average sickness and mortality of the prisoners for a period of seventeen years ending 1860-61. The column of "deaths to average strength" requires some little explanation. It means actually what it says, that is, the proportion of deaths to each one hundred persons constantly in jail. But the "average strength" of prisoners in a jail is subjected to greater variation than is the population of a Regiment, or native town. For the majority of offenders are confined only for short periods, and it frequently happens that the total number of persons passing through a jail in the course of twelve months, is thrice as many as the "average" number confined at any one time. In order that the apparently high mortality may in some degree be accounted for, I have given a third column, containing the percentage of mortality of the *aggregate* number of persons under observation in any one year.

From this explanation, it will be noticed that neither of these columns exhibits the *true* proportion of mortality in jail populations.

| NAME OF<br>ZILLAH OR<br>JAIL. | NATURE OF THE STAPLE FOOD OF FREE POPULATION.                                                             |                                  |                                                                    | ORDINARY JAIL DIET AND QUANTITY<br>OF GRAIN FOR HARD LABOR PRISONERS. |                                  |                                                                               | PER CENTAGE OF         |                                   |                                   |
|-------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------|------------------------|-----------------------------------|-----------------------------------|
|                               | Principal Cereal Grains.                                                                                  | Average<br>quantity<br>per diem. | Other Food.                                                        | Principal Cereal<br>Grains.                                           | Average<br>quantity<br>per diem. | Other Food.                                                                   | Admissions<br>in Jail. | Deaths to<br>average<br>strength. | Deaths to<br>average<br>strength. |
| Bellary.....                  | Cholam, Raggy, Cumbboo<br>(not much used), Rice by<br>Brahmins.....                                       | oz.<br>33                        | Mutton, Fish,<br>Ghee, Vegeta-<br>bles, Fruit, Milk,<br>and Sugar. | Cholam.....                                                           | oz.<br>23                        | A money allowance<br>daily for condi-<br>ments, dhol, and<br>meat, of 4 pice. | 51.2                   | 3.3                               | 1.7                               |
| Calicut .....                 | Rice.....                                                                                                 | 24 to 36                         | Do.                                                                | Rice.....                                                             | 26                               | Do. 4 pice.                                                                   | 180.2                  | 10.6                              | 5.4                               |
| Cannanore.....                | Rice.....                                                                                                 | 32 to 40                         | Do.                                                                | Rice.....                                                             | 26                               | Do. 3½ pice.                                                                  | 200.1                  | 2.7                               | 2.08                              |
| Chittoor.....                 | Raggy for poor people, Rice<br>for the rich, or both com-<br>bined.....                                   | Not known.                       | Do.                                                                | Raggy.....                                                            | 14                               | Do. 4 pice.                                                                   | 94.2                   | 3.9                               | 2.6                               |
| Chingleput .....              | Rice 40 varieties, Raggy, Cum-<br>boo.....                                                                | Not known.                       | Do.                                                                | Rice.....                                                             | 26½                              | Do.                                                                           | 131.9                  | 3.3                               | 1.7                               |
| Chiscoole .....               | Rice, Cholam, Raggy : Rice<br>preferred by the better<br>classes, the cheaper grains<br>used by the poor. | Not known.                       | Do.                                                                | Rice.....                                                             | 23                               | Do. 3½ pice.                                                                  | 56.1                   | 4.8                               | 3.3                               |
| Cochin.....                   | Rice.....                                                                                                 | Not known.                       | Do.                                                                | Rice.....                                                             | 23                               | Do. 3½ pice.                                                                  | 157.1                  | 4.7                               | 3.3                               |
| Combaconum.                   | Rice, Cholam, Cumbboo, Vee-<br>ragoo.                                                                     | 24                               | Do.                                                                | Rice.....                                                             | 26                               | Mutton 4 oz.<br>Ghee ½ oz.<br>Thrice a week.                                  | 231.6                  | 10.8                              | 3.4                               |
| Cuddalore.....                | Raggy, Cumbboo, Tennay,<br>Rice.....                                                                      | 33                               | Do.                                                                | Dry Grains.....<br>or Rice.....                                       | 24<br>26                         | Do. 4 pice.<br>and meat once a<br>week.                                       | 97.7                   | 5.5                               | 2.8                               |

| NAME OF ZILLAH OF JAIL. | NATURE OF THE STAPLE FOOD OF FREE POPULATION.         |                             |                                                         | ORDINARY JAIL DIET AND QUANTITY OF GRAIN FOR HARD LABOR PRISONERS. |                            |                                                             | PER CENTAGE OF                  |                             |                               |
|-------------------------|-------------------------------------------------------|-----------------------------|---------------------------------------------------------|--------------------------------------------------------------------|----------------------------|-------------------------------------------------------------|---------------------------------|-----------------------------|-------------------------------|
|                         | Principal Cereal Grains.                              | Average quantity. per diem. | Other Food.                                             | Principal Cereal Grains.                                           | Average quantity per diem. | Other Food.                                                 | Admissions to strength in Jail. | Deaths to average strength. | Deaths to aggregate strength. |
| Cuddapah....            | Cholum, Raggy, Italian Millets.....<br>Rice a luxury. | oz.<br>48                   | Mutton, Fish, Ghee, Vegetables, Fruit, Milk, and Sugar. | Cholum.....                                                        | 30                         | Do. 3½ pice.<br>Mutton once a week<br>4 oz.<br>Dholl 1½ oz. | 145.7                           | 6.9                         | 3.1                           |
| Coimbatore....          | Cholum, Raggy, Cumboo;<br>Rice for the rich.          | 24 to 40                    | Do.                                                     | Cholum.....                                                        | 24                         | Mutton, thrice a week 5 oz.                                 | 89.05                           | 11.4                        | 3.3                           |
| Guntoor.. ....          | Cholum.....                                           | Not known.                  | Do.                                                     | Cholum.....<br>Rice once a week                                    | 28                         | Do. 4 pice.                                                 | 67.06                           | 1.8                         | 1.1                           |
| Honore.....             | Rice along Coast.....<br>Dry Grains in the interior.  | 32 to 48                    | Do.                                                     | Rice.....                                                          | 26                         | Do. 4 pice.                                                 | 126.3                           | 3.08                        | 1.5                           |
| Madras.....             | Rice .....<br>Dry Grains.<br>Wheat flour.....         | 24<br>32 to 48              | Do.<br>Do.                                              | Rice.....<br>Cholum.....                                           | 24                         | Do.<br>Mutton or Fish 2 oz.<br>4 pice.                      |                                 |                             |                               |
| Kurnool.....            | Cholum, Rice.....                                     | Not known                   | Do.                                                     | Rice at discretion of Medical Officer.                             |                            |                                                             | 107.9                           | 6.2                         | 2.7                           |
| Madura.....             | Raggy, Rice, Cumboo, Cholum, Millets.                 | Not known.                  | Do.                                                     | Rice 5 days.....<br>Raggy 2 days.....                              | 28<br>24                   | Do. 4 pice.                                                 | 177.3                           | 18.02                       | 4.8                           |
| Mangalore....           | Rice.....                                             | Not known.                  | Do.                                                     | Rice.....                                                          | 23                         | Do.<br>Fish 2 oz.                                           | 137.2                           | 7.8                         | 3.6                           |

|                        |                                                                  |               |     |                 |    |     |                                         |       |      |      |
|------------------------|------------------------------------------------------------------|---------------|-----|-----------------|----|-----|-----------------------------------------|-------|------|------|
| Masulipatam..          | Rice.....                                                        | 32            | Do. | Rice.....       | 23 | Do. | 5 pice.                                 | 57.7  | 3.5  | 2.1  |
|                        | Raggy, Cholom and Cumboo<br>for the poor.                        |               |     |                 |    |     |                                         |       |      |      |
| Nellore.....           | Cholom, Raggy, Rice.....                                         | 48 to 64      | Do. | Rice.....       | 28 | Do. | Milk and Ghee,<br>every second day.     | 52.8  | 5.3  | 2.2  |
| Ootacamund<br>5 Years. | Raggy, Milleta, Rice.....                                        | 24            | Do. | Rice.....       | 24 | Do. | Dholl 3½ oz.<br>Mutton Weekly<br>10 oz. | 308.8 | 2.8  | 1.07 |
| Paumbem.....           | Raggy, Cholom, Rice, Cum-<br>boo.....                            | 28 to 32      | Do. | Raggy, Cumboo.  | 24 | Do. |                                         |       |      |      |
| Rajahmundry            | Rice.....                                                        | Not known.    | Do. | Rice.....       | 28 | Do. | Saltfish 2½ oz.                         | 131.4 | 6.06 | 2.7  |
| Salem.....             | Rice by the wealthy, Raggy<br>and Cumboo by the poor.            | Not known.    | Do. | Raggy & Rice... |    | Do. | 4 pice.                                 | 174.9 | 19.9 | 6.4  |
| Tranquebar...          | Rice on the Coast.....                                           | 24            | Do. | Rice.....       | 26 | Do. |                                         | 249.7 | 4.9  | 2.1  |
| Tellicherry...         | Dry grains in interior.....                                      | 38            | Do. | Rice.....       | 26 | Do. | 3½ pice.                                | 96.02 | 3.7  | 2.1  |
| Tinnevely...           | Rice.....                                                        | Not known.    | Do. | Cumboo.....     | 24 | Do. | 3½ pice.                                | 74.7  | 4.4  | 2.4  |
|                        | Cumboo.....                                                      | 44            | Do. |                 |    |     |                                         |       |      |      |
|                        | Raggy.....                                                       | 74            | Do. |                 |    |     |                                         |       |      |      |
| Trichinopoly.          | Cholom, Tennay, Rice.....                                        | Not known.    | Do. | Rice.....       | 26 | Do. | 3½ pice.                                | 84.5  | 5.8  | 3.5  |
| Vizagapatam.           | Rice, Cholom.....                                                | 32            | Do. | Rice.....       | 26 | Do. | 3½ pice.                                | 109.3 | 3.4  | 2.2  |
| Vellore.....           | Cholom, Raggy & Cumboo.<br>Rice, Raggy, Cholom, Cum-<br>boo..... | 32<br>{<br>61 | Do. | Raggy.....      | 14 | Do. | 4 pice.                                 |       |      |      |
|                        |                                                                  |               |     | Rice.....       | 8  |     |                                         |       |      |      |



With regard to the exact quantity of food consumed by the labouring population, the reports from several of the zillah Surgeons are by no means explicit. There is however a remarkable general testimony, when the quantities are mentioned, to shew that the bulk of food consumed by an ordinary well-to-do native, is much in excess of that considered necessary for a prisoner condemned to hard labour. A free labourer, if he has the means, will use from thirty-two to forty ounces of (cereal) grain, (cholum, raggy, cumboo, or rice) about two or three ounces of dholl, a similar quantity of meat or fish, and fruits or vegetables, in addition. The average bulk of solid food, may be from 45 to 60 ounces per diem, whereas the maximum allowance of grain to a prisoner in jail is *twenty-eight* ounces, and in many jails not more than *twenty-four*, while the proportion and variety of meat, dholl, curry stuff, vegetables, fruits, &c., is very much below the standard consumption of the free population.

The rations of the Madras sepoy on foreign service include *thirty two ounces* of rice. It is the chief article of his diet in Burmah, where there is scarcely any animal food which the rules of caste will permit him to eat. It is said however that the quantity is more than a man can eat, especially when the food is cooked in messes. A portion of the ration is often sold by sepoys. It must be remembered that the duties of a native soldier in garrison are not of a nature to entail hard labour, and that less food is needed by sepoys under such circumstances than by ordinary cooly labourers.

The deficiency of animal food in the diet, and the excess of carboniferous material, is undoubtedly a fertile source of the prevalence of sickness in native Troops on foreign service. The mortality of Madras troops on this diet in Burmah, is more than double what occurs in Indian stations, where they find their own food.

The proportion of carboniferous to nitrogenous material in the rations of the sepoy is as *eight to one*, and the dietary is even worse adapted to preserve health, than the scale laid down for prisoners in jail. From numerous personal inquiries, I should be inclined to reckon the average consumption of cereal grain per diem of an adult labouring man, as rather under than above 30 ounces.

The greater variety of food, and its more liberal use by the free population, depends very much upon the means of

the individuals, as well as upon the supply of food in the district. In time of famine and drought, after repeated failure of the crops for want of rain, the quantities of grain given as the probable daily consumption of a healthy man, would be very much reduced, and at such seasons the jail diet would be superior to that of the greater number of the labouring poor. This is still too often the case. In years of scarcity, grain robberies and petty thefts are very prevalent, and many of these offences are committed with the express object of securing the jail rations as a remedy against starvation. At such times the want of due nourishment is painfully evident in the attenuated bodies of the poor. Many die from the immediate effects of starvation, while the great bulk of those who live to struggle against famine, have the vital powers so reduced that they are predisposed to suffer from the ravages of cholera, and typhus fever. The connection between famine and pestilence, the following of the latter in the wake of the former, has received many a practical illustration in the records of Indian history within the present century.

What has been said, therefore, with regard to the greater amount of food of the free population, refers rather to their capacity for eating, than to actual consumption, the latter being regulated in great measure by the means of the people, and the cheapness of the food.

Nature however is not often at fault in these matters, and if a man's stomach tells him that it can receive and digest two or three pounds of grain in twenty-four hours, those quantities are probably necessary to support the health and strength of the individual. The hard labouring man in temperate climates, can get through his work best on bread and meat, and beer, and the greater his bodily exertion, the more he requires of nourishing food.

The Indian labourer acts much upon the same principle. The harder he works the better he lives. The good living is a necessity of the hard work. One could not be kept up without the other. Instead of feeding upon rice, like the Brahmins and Chetties, who take no active exercise, he depends upon the more nutritious raggy, cholum or cumboo,

The Indian labourer obliged to resort to the more nutritive of the cereals in preference to rice.

for the staple of his food. The testimony to this fact is most complete, and the revelations of science with regard to the unsuitability of rice, as a supporter of strength

for those who have to live by the sweat of their brow, are strikingly confirmed by the practical experience of the laboring classes in India. Thus the Zillah Surgeon of Salem (Assistant Surgeon Crocker, M.D.) remarks :—"The physical condition of those who live on raggy, the highly developed state of the muscular system especially, the entire absence of all skin affections, the positive aptitude for any amount of arduous labour, are, in my opinion, convincing proof of its utility and highly nutritious qualities."

And again with reference to another of the millets, *cumboo*, Dr. Wilson of Madura remarks :—"There are people living in the south eastern portion of the district called Reddies who use this grain, almost exclusively for food, and they are remarkable as being a tall, robust, muscular race. They are an agricultural people ; some I have measured in the Civil Hospital and found to be six feet in height, and stout in proportion. They are not large eaters of animal food."

The Medical Officer of the Paumben jail notices that the living upon rice diet, necessitates an expenditure for either animal or vegetable food containing more nutriment, and he states that "the nutritive qualities of the coarser grains (raggy particularly) are so much appreciated that even the wealthy people often partake of them."

Dr. Busteed, the Zillah Surgeon of Combaconum, remarks, "that the classes whose food is of the coarsest description (raggy, or cumboo) are the most hardy, and capable of enduring great fatigue."

Dr. Fletcher of Cuddapah remarks of *cholum*, the staple food grain of the district :—"It is a very wholesome and nutritious grain, and is much eaten by those who require to work hard and endure much fatigue, in preference even to rice." The medical officer of Guntoor reports : "*Cholum* (Sorghum Vulgare) is the staple food of the people of this district ; it is very nutritious and much cheaper than rice." Dr. Æ. M. Ross writes : "The lower classes of all are they who eat most freely of animal food, and who have the hardest labour in the open air. The Dhees and Mahrattas may particularly be noted as hardy races, (they use the dry cereals more than rice) exposed to all the worst malarious influences in the district, and yet healthy to a wonderful degree."

The medical officer of Kurnool says, "the Mahomedans

adopt a varied diet, a considerable quantity of animal food being combined with the farinaceous, and other vegetable nourishment they habitually indulge in."

"The country people live principally upon *cholum*, and there is no doubt that it affords more nourishment than rice."

Dr. Wilson of Madura says: "Rice is used by the opulent, and inhabitants of towns, but raggy is the great staple of the poorer classes of the district." In the Salem and Tanjore districts it is reported that the labouring and industrial classes generally live upon raggy and *cholum*."

The reports however bear almost unanimous testimony to another fact, and that is, the great preference given to rice, by those whose means will allow them to purchase it. Why this should be is strange, and not at all easy of explanation at a first glance. Raggy, cumboo, and *cholum*, not only contain nearly double the amount of flesh-forming ingredients, in a given weight, but they are twice as cheap as rice, and occasionally three or four times the weight of dry grains may be had for the price of a measure of rice.\* Poverty and the necessities of labour cause the poor to feed on the food best suited to their condition: wheat flour in the North of India, the millets in Southern India; but, in the south at least, the labouring man sighs for the rice and ghee of the rich "Chetty" or "Brahmin," and estimates it as the perfection of diet, though beyond his reach, much in the same way as the bumpkins of rural England, are apt to regard the turtle and venison of city magnates.

The true explanation probably may be found in the fact, that rice has been the staple food of the Hindoos ever since

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\* In the *Fort Saint George Gazette* of 8th May 1863 is given a comparative statement by the Revenue Board of the cost of the various grains in each district. In the month of March 1863, the prices ranged as follows:—

|                                                       |              |
|-------------------------------------------------------|--------------|
| Rice, 2nd quality, from Rs. 215 to Rs. 422 per garce. |              |
| Cholum       "       "                                | 129 to 274 " |
| Raggy         "       "                               | 107 to 221 " |
| Horse gram   "       "                                | 115 to 276 " |

Rice was cheapest in Ganjam and dearest in Cuddapah; Cholum cheapest in Tanjore, and dearest in the neighbouring district of Tinnevely; Raggy cheapest in Tanjore, and dearest in Madras; Horse gram cheapest in Ganjam and dearest in Malabar. The enormous difference in prices within the Madras Presidency, even in contiguous districts, is not a little remarkable.

they have had a history, and especially of the higher castes, who had no need to labour for their daily wants. The great antiquity of rice cultivation is evident enough from the frequent mention of the grain in the *Institutes of Menu*, written more than three thousand years ago. To such a people, rice, aided by the milk and butter, the curds, and sweetmeats and vegetables of their daily diet, was not an unsuitable food. The fact of its being so highly estimated by the Brahmins and higher classes was sure to make it desired, and sought after by the lower orders. Brahminical superstition in the estimation of the value of the several articles of food, was certain to influence the feelings of those lower in the social scale; hence we probably have a partial explanation of the curious fact, that rice is the most popular food grain, though it be the least nutritious. So long as rice is the grain 'par excellence' of the rich, the dainty, and luxurious, it will be useless to expect that the common, but really more valuable cereals will take their proper place in popular estimation. Even in civilized countries it is not uncommon to find a fictitious value attached by the vulgar to certain articles of diet, amongst which may be mentioned "arrow root," and "jelly," as "strengthening" food for invalids. In some sea-side places, the fishing population esteem the product of their labours but lowly, and will rarely eat fish so long as they can get beef or mutton. During the progress of the Irish famine, an attempt was made to substitute the meal of Indian corn, as a nutritious substitute for the potatoe, but the prejudice was so strong against it, that to this day, it is but little used in Great Britain and Ireland.

Rice seems to be preferred by the people of India because it is used by their priests and aristocracy, certainly not on account of its intrinsic value as an article of food. The Chinese, Japanese and Burmese grow rice just as commonly as do the Hindoos, but the animal diet they consume along with it, prevents the evil consequences which result from a too great dependence upon this grain, as the staple food of a nation.

If rice be so unsuited as the principal food of a people, the evidence in corroboration of the fact ought to be found in the effects of those prison dietaries which have that grain for their foundation, and there is no doubt that the ratios of sickness and mortality in jails, where rice is

the principal food, will be found higher as a rule, than in prisons where dry grains are chiefly used. The jails of the Punjaub and North West Provinces, where the prisoners live upon wheat flour, have a lower rate of mortality than those in Bengal, where rice is the staple grain. The Burmese jails, in which rice is the chief food, are notorious for their high average mortality, and yet the Burmese when enjoying an unrestricted diet are a fine stalwart race, and by no means sickly. Unfortunately, the disturbing elements in the Madras Presidency are so considerable, that the actual jail returns do not show the fact of increased mortality in rice eaters at all clearly. In the following abstract table is given the sickness and mortality of twenty-six jails, for a series of years. In nine of these jails the principal food has been dry grains; in seventeen rice.

|                              | Admissions<br>to<br>strength. | Deaths<br>to<br>strength. | Deaths to<br>aggregate<br>strength. |
|------------------------------|-------------------------------|---------------------------|-------------------------------------|
| Jails with dry grain food... | 103·26                        | 7·0                       | 2·9                                 |
| Do. with rice.....           | 140·70                        | 5·6                       | 2·6                                 |

This simple table shows, that the proportion of sickness has been least in the dry grain jails, but the mortality has been higher.

The excess of deaths, however, is explainable on other grounds than the nature of the food. The "dry" grain jails include the notoriously insalubrious buildings at Salem\* and Coimbatore, two of the worst in the whole Presidency, in which the average annual mortality, chiefly from defective accommodation, ventilation, &c., was 19·9 and 11·4 per cent. respectively. To prove that the excessive mortality in these jails arose from causes unconnected with food, it is only necessary to refer to the fact that when the prisoners were moved out of the old Salem jail into the new building, they became fairly healthy, and would no doubt have continued so, if the new jail had not in its turn, been made to accommodate four times the number of prisoners for which it was intended. If the mortality in these two jails, due to sanitary defects in the buildings, could be subtracted, the contrast between the effects of dry grains and rice diet would be very marked. The healthiest jail in

Guntoor the healthiest jail.  
Dry grain diet used there.

\* I allude here to the old Salem Jail, the mortality in which is included in these statistics.

the whole Presidency is at Guntoor, where the prisoners subsist on cholum. They are not over-crowded, and the ventilation and site of the building, according to Mr. Rhode, are good. The sickness amongst them is very slight, and the average mortality only 1·8 per cent., a ratio probably lower than what obtains among the free population of the town and district. It is to be regretted that the insalubrity of so many of the jail buildings should be so marked, as to disturb all calculations of this nature, otherwise the figures of the table might have been appealed to in evidence of the undoubtedly superior nourishing powers of the dry grains over rice.

The testimony of Medical Officers as to the insufficiency of

Bad effects of a rice diet.

rice as the chief article of diet may be here alluded to. Mr. Æ. M.

Ross says of the rice feeding people of the Western Coast :—"The Brahmins have no bodily strength, they never attempt any muscular exertion, leaving that entirely to the lower classes; they are very apathetic, they fall readily before disease, and are subject more than others to the diseases of insufficient nutrition. The standard of age is low." The Civil Surgeon at Mangalore observes also, "the prisoners are incapable of long and continued exertion." At Masulipatam, the use of rice as the

Disease *beri-beri* peculiar to rice-eaters.

chief food of prisoners has been mentioned as a probable excitant of the disease *beri-beri*, which

seems to be peculiar to rice eaters. The Madras sepoy in Burmah, whose rations consist of rice, a little dholl, and ghee, with condiments, suffered a great deal from it in the late occupation of the Province. The Rajpoots of the Bengal Native army serving in Burmah who lived upon *atah* (wheat flour) were not affected. Nor is the disease common amongst the Burmese who eat largely of animal food, fish, pork, &c. in addition to the rice which grows so plentifully in their country.

At Nellore, the Medical Officer reports that the inhabitants of the hilly tracts who live upon dry grains are "hard working," and that the Banians, Brahmins, &c. who live upon a rice diet, are "notoriously sedentary in their habits." In Rajahmundry, the Brahmin (rice-eating) class are said to be more subject to *beri-beri* than others. This peculiar

disease is very common in the district where rice is largely grown.

The Medical Officer of Salem states, "Rice is not so well adapted for the requirements of nature as raggy." In the district of Tinnevely, Dr. Gillies reports, "the liking for cumboo grain (*Penicillaria Spicata*) (amongst the labouring population of the interior) to be so great, that were any to offer a labourer rice, he would at once express his preference for the cumboo, asserting it to be the most satisfying."

Dr. Dorward observes of the rice-eating people of Trichinopoly:—"They are not so fine a race physically as those men who eat wheat or raggy."

At Vizagapatam jail, where the prisoners enjoy a rice diet, the Medical Officer remarks: "They suffer much from diarrhoea, dysentery, and the ænemic condition commonly called beri-beri, and any epidemic visiting the district falls with great severity upon them." All the prisoners from the hill tracts of the northern Circars suffer much from confinement in the coast jails, when the diet is so different from their ordinary fare. The mortality amongst the Hill criminals is something frightful.

Dr. Goodall in noticing that Vellore is a healthy place of residence for Natives observes: "The five kinds of cereals in general use are cheap, with the exception of rice, which has risen in price this season—animal food, chiefly mutton, is abundant and moderately priced. Good, cheap, and varied vegetable and animal food, must here, as elsewhere, conduce to health and prolonging of life."

Variety of animal and vegetable food essential to health. The last observation is undoubtedly correct. It is the *variety of food*, both animal and vegetable, which conduces most to health and longevity.

To understand more clearly the reason why rice in itself, although the most popular food of all the Indian cereals, is unfitted to sustain the strength of the labourer, it is necessary to give a brief table in illustration of the comparative nutritive value of the Indian grains. For the analyses of raggy, cumboo, and cholam, I am indebted to the table given by Professor J. E. Mayer in Vol. II of the *Madras Medical Reports*, published in 1855.



*Table of the composition of some articles of food in  
100 parts.*

|                                         | Quantity of nitro-<br>genous or flesh-<br>forming ingredi-<br>ents. | Quantity of non-<br>nitrogenous or<br>respiratory food. | Quantity of mine-<br>ral ingredients. |
|-----------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------|
| Butcher meat, free from bone... ..      | 23.34                                                               | 14.30                                                   | .50                                   |
| Butter, fat, &c. . . . .                | 0.00                                                                | 100.00                                                  | 0.00                                  |
| Bhoot (Saja hispida) ... ..             | 40.63                                                               | 47.25                                                   | 4.00                                  |
| Cooltee ... ..                          | 23.47                                                               | 62.00                                                   | 3.34                                  |
| Peas ... ..                             | 23.40                                                               | 60.00                                                   | 2.50                                  |
| Lentils ... ..                          | 28.22                                                               | 40.08                                                   | 0.00                                  |
| Wheat flour ... ..                      | 17.00                                                               | 66.00                                                   | 0.70                                  |
| Raggy after being deprived of moisture. | 18.12                                                               | 80.25                                                   | 1.03                                  |
| Cholum do. do. ...                      | 15.53                                                               | 83.67                                                   | 1.26                                  |
| Cumboo do. do. ...                      | 13.92                                                               | 83.27                                                   | .73                                   |
| Rice do. do. ...                        | 9.08                                                                | 89.08                                                   | 0.42                                  |
| Potatoes ... ..                         | 2.40                                                                | 22.80                                                   | 1.00                                  |
| Cabbage ... ..                          | 1.75                                                                | 4.05                                                    | 2.70                                  |

The nutritive value given by Mr. Mayer for rice is higher than that of most other chemists who have analysed it. This may be in part accounted for by the fact, that in all his analyses the grain was first of all dried at a temperature of 212°, to rid it of its natural moisture. Mr. Balfour (*Cyclopædia of India*, page 856) quoting from an English work, gives only 5.43 per cent. as the proportion of albuminous matter, while Pereira (*Materia Medica*, Vol. I, page 65) gives 7.40 as the proportion obtained from rice in the Giessen (Leibig's) laboratory. It is abundantly clear, however, why the dry Indian cereals are better fitted for those who have to endure hard labor. They contain a large proportion of those nitrogenous compounds, in which rice is deficient. The nutritive value of rice perhaps varies a little, according to the species of the plant, and the locality in which it is grown; but under any circumstances, it is not equivalent to an equal weight of raggy or cholum as a supporter of life. Rice appears to undergo some changes by keeping, which render it more easy of digestion. New rice almost invariably causes derangement of the bowels in those who eat of it. From Dr. Shortt's experiments, which are here quoted, it is clear that there are physical differences

Rice deficient in flesh-forming materials.

in old and new rice ; though why the older grain should be the most wholesome article as food, is not very clear.

"Rice is husked, cooked and uncooked, but the majority prefer the cooked. That is to say, that the paddy is first well boiled and then dried in the sun till it becomes quite hard, when it is husked and sold in the bazaars. Rice from the unboiled paddy is much whiter than that from the boiled paddy, consequently the former is termed "table rice," and is that which is generally laid on our tables. It is preferred more on account of its color, but is believed not to be so conducive to health as the rice from boiled paddy.

People unaccustomed to the use of table rice, or rice from the unboiled paddy, invariably suffer from derangement of the stomach and bowels after eating it ; this fact is well understood by the natives.

It is necessary that paddy should be kept at least six months before it is cooked, to allow time for the complete consolidation of the grain. If paddy that has been recently harvested be used before that time, it invariably causes derangement of the bowels, no matter whether it be rice from the unboiled or boiled paddy : the more recent the age of the paddy, the more liable is it to derange the bowels.

There is also a difference in the quality of new and old rice.

*New rice.* Twenty-four and a half ounces of this rice boiled with six pints and twelve ounces of water took 37 minutes to cook. On straining the rice, the conjee water was 3 pints, 8 oz., with a specific gravity of 1.005. Weight of the rice when boiled, 64½ oz. The grains of the boiled rice are soft and inclined to be pulpy. If kept cold twelve or sixteen hours, it parts with a quantity of fluid and becomes quite soft and unfit for food.

*Old rice.* Twenty-four and half ounces of this rice boiled in six pints and twelve ounces of water, took exactly one hour to cook. The strained conjee water measured 3 pints : specific gravity 1.001. The rice weighed (after being boiled) 64½ oz. The grains of the rice were firm and fit for food after 30 hours keeping, and it had not parted with its fluid nor become soft.

It will be seen that the new rice is boiled in half the time it takes to boil the old. The conjee water exceeds that of the old by 8 oz., and has a greater specific gravity ; although the weight of both old and new rice is the same when boiled.

The new rice is sold in the bazaars generally in the months of January, February, March, and April. In these months bowel derangements prevail in the district, as also in the jail when the new rice is supplied."

Mr. Mayer has so clearly explained the position of rice in the Dietary Scale, that it seems only right to quote his own words. Mr. Mayer's opinion of rice. "Though rice holds the lowest place when taken as the only food of an animal, yet if it should form only a part of that food, and the remainder consist of meat, eggs, or other albuminous matter, in such proportion that besides the amount of non-nitrogenous substances, the whole food contains a sufficient proportion of albuminous or nitrogenous matter, rice may be as useful as any other grain, it is only when viewed as the *sole food* of an animal that it will hold the lowest place as an article of nourishment."

In contrasting the food of the free population, with that of prisoners in the Madras Presidency, we shall find some remarkable variations, especially in regard to the proportions of flesh-forming ingredients.

Dr. Christison,\* who for many years past has investigated the subject of prison Dietaries in relation to health, has thus stated his views :—  
Dr. Christison on the proper proportions which should exist between the carboniferous and nitrogenous ingredients of food.

"Experience has shown that the most successful Dietaries for bodies of men, deduced from practical observation, contain carboniferous and nitrogenous food in the proportion of about three of the former to one of the latter by weight. During two and twenty years that my attention has been turned to the present subject, not a single exception has occurred to me."

"Hence it is obvious that the least weight of food in the rough state will be required—first, when there is least moisture and cellular tissue in it, and secondly, when the carboniferous and nitrogenous principles are nearest the proportion of three to one."

"Of the various nutritive principles belonging to each set, some may replace one another—some are better than others ; some are probably essential."

"Two things however are certain, that nitrogenous may replace carboniferous food for supporting respiration, though at a great loss ; but that carboniferous food (without nitrogen) cannot replace nitrogenous food for repairing textural waste."

"Dietaries ought never to be estimated by the rough weight of their constituents, without distinct reference to the real nutriment in these, as determined by physiological and chemical inquiry."

"Keeping these principles in view, and with the help of a simple

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\* Observations on a Report by Sir J. McNeill relative to rations for Soldiers.—1855.

table, it is not difficult to fix the dietary advisable for any body of men, according to their occupation. It is also, in general, easy to detect the source of error in unsuccessful dietaries. For example, any scientific person conversant with the present subject could have foretold as a certain consequence, sooner or later, of their dietary, that the British Troops would have fallen into the calamitous state of health which befell them last winter in the Crimea."

The Dietaries of Indian prisons have heretofore been for the most part arbitrarily fixed, and

Indian prison Dietaries defective in arrangement.

without regard to the scientific data we already possess in reference to the relative values of food. For instance with Mr. Mayer's analyses of the Indian cereals, we are forced to admit that sixty-five Rupees' weight of rice does not contain anything like the same amount of nitrogenous principle which is found in sixty Rupees' weight of raggy or cholum; and yet in the majority of the Madras jails, these quantities are considered as equivalents or substitutes one for the other. The injudicious dietaries of our jails have a

Excessive sickness and mortality often due to defective diet.

great deal to do with the excessive mortality of prisoners, though in Madras at least, there are other causes which influences their health, and especially the over-crowding and deficient ventilation of most of the jail-buildings.

Dr. Ewart\* has compiled a table from official sources showing the ratio of deaths from

Dr. Ewart's opinion.

diarrhoea and dysentery per 1000 of strength amongst sepoys and prisoners in the three Presidencies, and the results are very remarkable as illustrating the different conditions under which the two classes live as regards food and house accommodation.

|                                                                                  |          | Ratio of deaths<br>from dysentery<br>and diarrhoea<br>Per 1000 of<br>strength. |       |
|----------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------|-------|
| Mortality of<br>sepoys and pri-<br>soners from<br>bowel complaint<br>contrasted. | Bengal.. | Prisoners 1833 to 1854.....                                                    | 21.65 |
|                                                                                  |          | Sepoys.... 1833 to 1852-3.....                                                 | 1.63  |
|                                                                                  | Bombay   | Prisoners 1831 to 1853-4.....                                                  | 15.07 |
|                                                                                  |          | Sepoys.. 1831 to 1853-4.....                                                   | 2.09  |
|                                                                                  | Madras.  | Prisoners 1844 to 1853.....                                                    | 16.99 |
|                                                                                  |          | Sepoys... 1842 to 1851.....                                                    | 2.10  |

\* Ewart on the Sanitary condition of Indian jails, page 60.

The results of improving the diet of the prisoners in the Bombay House of Correction were to reduce the proportion of sickness and mortality\* according to the following table:—

|                                                | Admissions per 1000. | Deaths per 1000 strength. |
|------------------------------------------------|----------------------|---------------------------|
| Under—The old and deficient diet for 10 years. | 1,761                | 64·5                      |
| The new improved diet for 4 years.             | 818                  | 11·14                     |

The sickness and mortality following close upon unscientific tampering with the diet scale of prisoners in the Alipore jail, according to Dr. Strong†, was followed by an increase in mortality, from 42·4 per thousand to 117·5. Here, by order of the Magistrate, the food was reduced from 45 ozs. per diem to 27½ ozs., which was *obliged to be consumed in a single meal.*

Dr. Ewart calculates that in this reduced diet, the nitrogenous nutriment instead of being in the proportion of one to three, as science has shown to be necessary, was only in the proportion of 1·49 to 19·42!

In the following table is given the Dietaries now in use in most of the Bengal, Punjaub, and Madras jails, a portion of it has been copied from Dr. Ewart's table at page 73 of his work on the Sanitary condition of Indian jails. In most of the Madras prisons, however, the quantities of condiment, salt, and animal food can only be guessed at, in consequence of the objectionable system of allowing a fixed sum of money to cover the cost of these articles. It is but reasonable to conclude that 3½ pice or four pice per diem does not represent an equal weight of condiment or animal food in every district.

\* A contribution to Dietaries, by A. H. Leith, M.D., Bombay Medl. and Phys. Soc. Trans. 1851-52.

† Indian Annual Medical Science, No. 5, October 1855.

Table shewing the amount of food in Indian prison dietaries.

| ARTICLES.     | Bengal. |          | Punjaub. |          | Coimbatore dry grain diet. |          | Madras rice diet.                                                                                  |          | Madras, now proposed by Mr. Rohde. |          |
|---------------|---------|----------|----------|----------|----------------------------|----------|----------------------------------------------------------------------------------------------------|----------|------------------------------------|----------|
|               | Lab.    | Non-Lab. | Lab.     | Non-Lab. | Lab.                       | Non-Lab. | Lab.                                                                                               | Non-Lab. | Lab.                               | Non-Lab. |
| Rice ...      | 24      | 22       | ...      | ...      | ...                        | ..       | 26                                                                                                 | 24       | 8                                  | ...      |
| Raggy ...     | ...     | ...      | ...      | ...      | 24                         | 22       | ..                                                                                                 | ...      | 14                                 | ...      |
| Cholum ...    | ...     | ...      | ...      | ...      | ...                        | ...      | ...                                                                                                | ...      | ...                                | ...      |
| Cumboo ...    | ...     | ...      | ...      | ...      | ...                        | ...      | ...                                                                                                | ...      | ...                                | ...      |
| Wheat flour.  | ...     | ...      | 20       | 16       | ..                         | ...      | ..                                                                                                 | ...      | ...                                | ...      |
| Attah ...     | ...     | ...      | ...      | ...      | ...                        | ...      | ...                                                                                                | ...      | ...                                | ...      |
| Dholl ...     | 4       | 6        | 4        | 4        | 1½                         | ½        | ...                                                                                                | ...      | 2                                  | ...      |
| Fish or ...   | 2       | ...      | ...      | ...      | 2                          | ...      | ...                                                                                                | ...      | ...                                | ...      |
| Flesh ...     | ...     | ...      | ...      | ...      | ...                        | ...      | ...                                                                                                | ...      | ...                                | ...      |
| Ghee ...      | ...     | ...      | ...      | ...      | ...                        | ...      | ...                                                                                                | ...      | ...                                | ...      |
| Oil ...       | ½       | ½        | ...      | ...      | ...                        | ...      | ...                                                                                                | ...      | ...                                | ...      |
| Butter-milk.  | ...     | ...      | ...      | ...      | ...                        | ...      | ...                                                                                                | Do.      | ...                                | ...      |
| Salt ...      | ½       | ½        | 67½      | 67½      | ½                          | ½        | The quantity of vegetable, dholl, condiment and meat restricted to what can be bought for 4 piece. |          | Condiments as at present.          |          |
| Condiments..  | ½       | ½        | 86       | 86       | ½                          | ½        |                                                                                                    |          |                                    |          |
| Vegetables... | 4       | 2        | ...      | ..       | 6                          | 6        |                                                                                                    |          |                                    |          |
| Total...      | 35½     | 31½      | 24½      | 20½      | 34½                        | 31½      | Unknown.                                                                                           |          | Unknown.                           |          |

REMARKS.—The Coimbatore jail is one where the diet has been specially sanctioned, and in which is allowed per week, 15 ounces of meat to each convicted prisoner on account of the insalubrity of the building. In the generality of Madras prisons it is impossible to fix the scale of solid food; but it is probably under thirty ounces for those sentenced to hard labor. The usual purchases with the money-allowance may be thus given:—

|                          |    |                                    |
|--------------------------|----|------------------------------------|
| Dholl.....               | 2½ | ounces per diem.                   |
| Salt.....                | ½  | do.                                |
| Condiments and tamarind. | ½  | do.                                |
| Meat or fish.....        | 4  | do. once a week.                   |
| Vegetables, pumpkins, .. | 6  | do. { twice or three times a week. |
| cucumbers, bringals....  |    |                                    |

Dr. Ewart has calculated the proportions of the nitrogenous and non-nitrogenous principles in the Bengal and Punjaub dietaries. Dr. Wyndowe has kindly undertaken for this report the

Proportions of nitrogenous and non-nitrogenous principles in various prison and hospital diets.

same task, with regard to some of the prison and hospital diets in Madras.

The results are given in the form below.

|                                           |                      |     |     | Carbonaceous<br>nutrient. | Nitrogenous<br>nutrient. |
|-------------------------------------------|----------------------|-----|-----|---------------------------|--------------------------|
| Bengal Prison                             | Non-laborers...      | ... | ... | *5.8                      | to 1                     |
| Dietary.                                  | Laborers             | ... | ... | 5.7                       | " 1                      |
| Punjaub.....                              | Non-laborers         | ... | ... | 3.68                      | " 1                      |
|                                           | Laborers             | ... | ... | 3.76                      | " 1                      |
| European Soldiers' Rations, India         |                      | ... | ... | 2.3                       | " 1                      |
| Madras Sepoys' Rations (Foreign Service). |                      | ... | ... | 8.2                       | " 1                      |
| European Hospital Diet, "Full"            |                      | ... | ... | 2.                        | " 1                      |
| Do. "Half"                                |                      | ... | ... | 2.68                      | " 1                      |
| Do. "Fish"                                |                      | ... | ... | 3.35                      | " 1                      |
| Native Do. "Full"                         |                      | ... | ... | 7.2                       | " 1                      |
| Madras Jails, Coimbatore—Labourers,       |                      | ... | ... | 6.0                       | " 1                      |
| Calicut, rice diet.....                   | do. { meat days      | ... | ... | 6.0                       | " 1                      |
|                                           | do. { other days     | ... | ... | 9.0                       | " 1                      |
| Paumben, dry drains....                   | do. meat day, once a | ... | ... |                           |                          |
|                                           | week.                | ... | ... | 2.8                       | " 1                      |
|                                           | do. 6 days a week    | ... | ... | 4.5                       | " 1                      |
| Chittore and Vellore, mixed grain         | do.                  | ... | ... | 5.5                       | " 1                      |
| Ootacamund Native Jail                    | { meat days          | ... | ... | 5.5                       | " 1                      |
|                                           | { other days         | ... | ... | 8.8                       | " 1                      |

From this table it will be easily seen how deficient are the jail dietaries of Bengal and Madras in the due admixture of the nitrogenous principles of food. The Punjaub scale, where wheaten flour is used, is the nearest approach to the proportions indicated by Dr. Christison as essential to maintain health and vigour for any length of time among large bodies of men.

Impressed with the insufficiency of the diet in the Calicut jail, Dr. Wyndowe, the late Civil Surgeon, not long ago submitted a proposal to exchange the twenty six ounces of rice daily, with such

Deficient diet in Calicut.  
Dr. Wyndowe's suggestions for  
its improvement.

\* These figures appear to be erroneously entered in Dr. Ewart's book as 14.28 for non-labourers, and 13.33 for labourers—the proportions appearing very high. I asked Dr. Wyndowe to be good enough to re-calculate the proportions for the specified food of the diet table, and the corrected proportions are as indicated above.

meat, condiments and vegetable as could be bought for four pice, for the following scale :—

## WEEKLY ALLOWANCE.

Hard labor prisoners. Non-laborers. Under  $\frac{1}{4}$  month in jail.

|                                       | OZS.              |       | OZS.              |       | OZS.              |
|---------------------------------------|-------------------|-------|-------------------|-------|-------------------|
| Rice.....                             | 112               | ..... | 84                | ..... | 70                |
| Dholl.....                            | 56                | ..... | 42                | ..... | 35                |
| Fish.....                             | 60                | ..... | 60                | ..... | 60                |
| Vegetable.....                        | 12                | ..... | 12                | ..... | 12                |
| Oil.....                              | 8 $\frac{1}{2}$   | ..... | 3 $\frac{1}{2}$   | ..... | 3 $\frac{1}{2}$   |
| Salt.....                             | 7                 | ..... | 7                 | ..... | 7                 |
| Condiments and<br>tamarind.....       | 8 $\frac{1}{2}$   | ..... | 8 $\frac{1}{2}$   | ..... | 8 $\frac{1}{2}$   |
|                                       | 259 $\frac{1}{2}$ |       | 217 $\frac{1}{2}$ |       | 196 $\frac{1}{2}$ |
| Average quantity<br>of food daily.. } | 37                |       | 31                |       | 28                |

In this allowance the proportion of nitrogenous to carboniferous nutriment has been kept as closely as possible to Dr. Christison's scale of one to three—the actual proportions being carboniferous 41·761 to nitrogenous 13·76. The cost of the hard labor diet in this scale would be a fraction more than an anna and half per diem, or nearly three Rupees per month. Its cost perhaps might be materially reduced by substituting the dry grains in part for the rice and dholl and fish—the quantities of the two latter being in excess when compared with the bulk of rice.

Dr. Wyndowe considered some essential change in the diet to be necessary; as, in his opinion, “the large average mortality and increasing prevalence of disease” was occasioned by “defective nutrition.” Shortly after making his recommendation, and before any action could be taken on it, epidemic cholera broke out amongst the badly nourished inmates of the jail, and in the space of two weeks destroyed about 25 per cent. of the whole strength of prisoners.

The dry grains, cholum and raggy, it seems are not procurable on the Western coast; but if they cannot be economically introduced there from the adjoining district of Coimbatore, some special provision should be made in the Dietary scales of all jails on the coast where rice is the staple food, so as to make up in some degree the deficiency in the nitro-



genous elements of a rice diet. Such jails will require a liberal allowance of flesh or fish, milk or curds, to be supplied to the prisoners—if the latter are to be kept up in health and strength.

Dr. Ewart, in reviewing the various Dietaries of prisoners in India, came to the conclusion that none of them were perfect, and he devised a scale of food himself, which is given below.

| ARTICLES.         | For Bengal.      |                  | For North West Provinces and Punjaub. |               |
|-------------------|------------------|------------------|---------------------------------------|---------------|
|                   | Laborers.        | Non-Laborers.    | Laborers.                             | Non-Laborers. |
|                   | ozs.             | ozs.             | ozs.                                  | ozs.          |
| Rice... ..        | 10               | 8                | ...                                   | ...           |
| Attah ... ..      | ...              | ...              | 20                                    | 16            |
| Dholl... ..       | 14               | 10               | 6                                     | 2             |
| Fish ... ..       | 12               | 10               | ...                                   | ...           |
| Mutton ... ..     | ...              | ...              | 8                                     | 6             |
| Butter-milk... .. | 16               | 8                | 1                                     | 1             |
| Ghee... ..        | $\frac{1}{2}$    | $\frac{1}{2}$    | 1                                     | 1             |
| Salt ... ..       | 1                | 1                | 1                                     | 1             |
| Condiments ... .. | 1                | 1                | ...                                   | ...           |
| Total weight...   | 54 $\frac{1}{2}$ | 38 $\frac{1}{2}$ | 37                                    | 27            |

For the class of persons who do not consume flesh, Dr. Ewart proposes curds and butter-milk in lieu thereof.

The objection to this scale, and in some degree to Dr. Wyndowe's, is not that the elements of nutrition are deficient or in excess, but that the shape in which those elements are provided, is not the best suited for assimilation. There is no doubt that dholl and other pulses are very nutritious grains, and that they are very rich in nitrogenous principles. In moderate quantities this kind of food is digested and assimilated, but weak stomachs find a difficulty in disposing of it.

Quantity of dholl in excess. It is curious that in the various dietaries of the free population, these grains are only consumed in small quantities (the average daily allowance being from two to four ounces.)

Now, Dr. Wyndowe proposes to use eight ounces, and Dr. Ewart suggests fourteen. It is highly probable that these quantities could not be digested. Peas, beans, and lentils are known to cause flatulency and indigestion in those who partake of them. Dr. Hassall\* remarks of this description of food—

“When taken as an article of diet, they are found by most to be difficult of digestion, to occasion distention and flatulency, and to be slightly aperient. These properties and effects are so similar in the case of each, that it is almost impossible to draw any decided line of demarcation between them. We recently partook of some of Du Barry’s “*Revalenta Arabica*” (the meal of the lentil *Ervum Lens*), and found the flatulent effects so unpleasant that we should not readily be induced to repeat the experiment.”

The experience of Medical officers of Native corps seems to prove that the free use of dhol, is a frequent cause of diarrhœa and indigestion. Nothing is more common than to find sepoys complaining of diarrhœa, and voiding dhol per anum in an undigested condition.

In the Allahabad district and some parts of Oude, the poor people subsist on a kind of vetch called *Kessaree dal*, or the *Lathyrus sativus* of botanists.

This grain when used as the sole food of the people, according to Dr. Irving, the Civil Surgeon of the district, causes paralysis of the lower extremities. Some villages have, from ten to fifteen per cent. of the population, who have become helpless cripples from this cause.

The inhabitants are perfectly aware of the poisonous nature of the food; but from the poverty of the soil of the district, it appears that no other grain will grow. Mr. Court, the Collector of Allahabad, writes, “it affords the only certain means of life.” The *Kessaree* grows in all seasons, and requires little or no culture.† It is not improbable that some other pulses if depended upon solely for nutriment, would have a prejudicial effect upon health.

So again with fish. It is a nutritious article of diet, and in one hundred parts contains almost the same amount of albuminous matter as beef and mutton; yet the latter are

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\* Hassall—Food and its adulterations, page 241.

† According to Dr. Forbes Watson, the *Kessaree dal* is much richer in nitrogenous principle than the chick pea or pigeon pea *dal*. Experience teaches that it is unwholesome, and yet if chemical constituents were the only consideration, it should be better fitted for sustaining life, than many other pulses.

better foods for working upon, and for satisfying the cravings of appetite. Fish is often moreover used in a semi-putrid state, from bad salting, and in this condition it undoubtedly predisposes to disease. There is something in the relative value of these things beyond the power of chemists to explain. In the dholi, the proportion of albuminous matter is ample to support life; but nobody lives entirely upon it. The mechanical condition in which this grain reaches the stomach, or some unknown cause, prevents more than a certain quantity of it being digested, and we find that the people, taught by practical experience, do not as a rule attempt to assimilate more than a small portion. Experience teaches also, that for the sustenance of those who endure much fatigue and hard labor, fish is not equal to mutton or beef. An English "navvy"—the type of a hard labourer—having the choice of food, prefers bread and beef in about equal proportions to any other fare.

The Indian palankeen bearers of the Telinga districts think nothing of running double stages, from 25 to 40 miles per diem, so long as the Sahib is regular in his present of "a sheep" every second or third day, and every particle of which, barring the skin and bones they consume. The waste of tissue incurred in severe labour must be compensated for by nourishing food brought to the digestive organs in such a form, that it can be readily acted upon by the solvent powers of the fluids of the stomach.

Dr. Mouat, the able and accomplished Inspector of Prisons in Lower Bengal, remarks of the dieting of prisoners "that there is something radically wrong in the system of diet is indisputable, and it is abundantly clear that the quantity and quality of food sufficient to maintain an agricultural labourer in health when at liberty, does not preserve him from the great plague and scourge of jails when in confinement. On the other hand, while feeding above the standard procurable in a state of liberty is a premium to crime, particularly in times of famine and distress, diet ought not to be made an instrument of punishment. The argument that a prisoner in jail gets a greater amount of food than an honest labourer of the same class, and that therefore the good living of the convict is more a temptation

Animal food necessary to the inhabitants of India who undergo severe exertion.

Dr. Mouat on Jail diets.

than a discouragement to crime, is not in itself a valid reason for reducing the diet of the latter, if it can be proved that a larger amount and greater variety of aliment is absolutely required for the same man in confinement, than was adequate to maintain him in health when at large. All disciplinarians admit that the amount of food to which a prisoner is entitled should be the minimum needed to keep him in health and strength."

"It is abundantly evident that from circumstances which appear to be inseparable from imprisonment in every part of the world, and in every variety of the human race which has been subjected to penal restraint, this amount is in excess of what is amply adequate to preserve the health and strength of the same classes and individuals in freedom."

These observations coming from one of Dr. Mouat's practical experience of the effects of jail dietaries must be allowed to have great weight in any proposal for the revision of existing scales of diet. It has been already shown that in Madras, the prisoners in jail get a less quantity of grain than the agricultural labourer ordinarily consumes, though in times of scarcity the prisoner feeds better than the cooly. Comparing the proposed dietaries with those now in use, it is evident that the prisoners are not getting under the present system a sufficient allowance of animal food.

The prisoner in the North West Provinces or Punjaub, who gets his twenty ounces of *atah* per diem, is much better provided with real nutriment than the Madras criminal who is fed on twenty-six or twenty-eight ounces of rice, and in this Presidency likewise the prisoners who are sustained on raggy, cholam, and cumbō have an infinitely superior staple for their diet than rice. In proposing radical changes in the system of jail dieting, it must be borne in mind that to secure the health and strength of a large assemblage of men in confinement certain requirements are absolutely essential.

1. The first is that the proportions of nitrogenous to carboniferous material in the food should be, as nearly as possible, as one of the former to three of the latter.

Desiderata in all dietary scales.

2. That to preserve health for any length of time, some *variety* in food is absolutely necessary.

3. That all dietaries should contain a proportion of animal, as of vegetable food. The present practice of allowing a fixed sum of money to cover the cost of condiments, fresh vegetables, and animal food for ordinary prisoners, is peculiar to Madras. It is erroneous in principle and objectionable in

Money allowance for condiments in Madras jails objectionable.

practice, inasmuch as three or four pie in one station will not purchase the same amount of spices, salt, and condiments that it will in another: in one place there may be enough surplus money to purchase meat, ghee, or fish once or twice a week. In another jail these necessities, owing to the high price of condiments, may never come within the reach of prisoners. If animal food is withheld, the health of the prisoner suffers. Animal food in some shape, though not always as flesh, is universally consumed by all classes of the free population.

4. That when the chief food of a jail is made up of grain, the *mechanical condition* in which

Mechanical condition in which the food grains are allowed most important.

it is taken into the stomach requires consideration, as its nutritive value depends in a great measure upon whether the particles have been minutely divided or not before they are brought into contact with the solvent juices of the digestive organs.

The "bran" of wheat contains a greater proportion of gluten than the inside flour. Brown bread, in which the finer particles of bran have been ground up with the flour, is more nourishing than pure white baker's bread. If this bran is only coarsely divided instead of being reduced to an impalpable powder, the mechanical condition in which it is received into the stomach prevents its assimilation, and it passes out of the body unaltered.

This point requires close attention in the substitution of raggy, cholum, and cumboo, for rice. The outer coating of the grain if not minutely pulverised sometimes irritates the bowels, and in any case it is not assimilated unless reduced to a fine powder, the full amount of nutriment of the grain being lost to the prisoners. With simple machinery there should be no difficulty in the cheap and economical reduc-

tion of these grains to a state of minute division fitted for nutrition.\*

5. That with a due admixture of the cereal grains, dhol, fresh vegetables, and animal food, it is possible to maintain the standard of health amongst prisoners, provided that they are not overcrowded, and that the sanitary condition of the jail buildings is unexceptionable. In proof of this may be mentioned the fact that in the English and Scotch Prisons, the mortality of prisoners is rather below that of the Civil population at similar ages. The Guntoor jail in this Presidency, which is not overcrowded, and in which the staple food is *cholum*, shows a very moderate average of sickness and mortality, the latter probably being no more than what occurs in the free population.

To secure that amount of variety of food which seems to be so essential to the health of prisoners, is the chief difficulty.

In all the jails of the inland districts rice need not be used at all, or only as a special treat on extraordinary occasions. Rice not essential in jail diets.

The dry grains furnish a sufficient variety, and the allowance might be so arranged as to give *cholum*, raggy, cumboo and other millets in turn, or a certain weight of one or the other grain for the morning meal and of a different grain for the evening. In jails situated in

\* The arrangements for the cooking of food in jails in this Presidency appear to be generally defective and to occupy much of the time of prisoners which should be devoted to hard labor. Wheat and raggy flour combined make an excellent bread; *cholum*, cumboo and the smaller millets, when reduced to fine flour may be used with advantage in a similar way, and it is questionable whether the grain would not be more economically prepared in this way, a portion of it at least, than by boiling, while at the same time it would be more suitable for health.

The practice which obtain in some jails of cooking the morning meal over-night is not free for objection, particularly in seasons of the year, when fermentation proceeds with great rapidity. A loaf of bread, containing the weight of grain allowed for the morning meal, would, it is thought, be a good form of issuing the ration, and one free from objection in a sanitary point of view.

rice-growing districts, that grain should form only a portion of the food. Of animal food the changes can only be rung upon mutton, goat-flesh, fish, milk, curds, butter-milk, and ghee. Of fresh vegetables or fruits, the issue must always depend upon the season of the year. In some jails in this Presidency, near the lines of Railway, potatoes might be introduced in lieu of other vegetables.

Whatever vegetables are used, the quantity should be fixed and never diminished because of scarcity or difficulty of supply. Quantity of vegetable food should be fixed. The tendency to scorbutic affections and impoverishment of blood in prisoners subjected to a jail diet, is so general and constant, that too much attention cannot be given to ensure a sufficient proportion of this kind of food.

The stimulating condiments demand less attention perhaps, but they should be allowed in a fair average proportion for each diet. Under the present system of a fixed *per diem* money allowance, the tamarind and salt of the prisoners' diets are, no doubt, often deficient. Of the former the quantity should not be less than half an ounce, and it might occasionally be varied, if limes were plentiful and cheap, by the substitution of the same quantity of lime juice. Of salt, it has been shown by physiological experimenters, that, at the least, *half an ounce* passes away in the urine every day, and nearly the same quantity by the skin and the fæces. To replenish this constant daily waste, and to supply the body with an ingredient so essential to it, the least quantity which should be provided is from three-fourths of an ounce to *one ounce*. In the Punjaub scale the quantity allowed is only *sixty seven and a half* grains, which is obviously insufficient. It must be borne in mind too that the common bazaar salt contains nearly one-third of dirt and impurity. The chlorides, are of course present in all cereal grains, in milk, flesh, and in the water drunk, but the quantities are not sufficient for the wants of the body. If the use of salt as a condiment is neglected, the living body becomes affected by intestinal parasites, and loss of health results.

From  $\frac{3}{4}$  to 1 ounce of salt necessary with a grain diet.

Bearing in mind what has been said with regard to variety

of food, I have attempted to sketch a dietary for a whole Proposed diet for Madras week, such as would, I think, be sufficient to maintain health, without pampering the prisoners with food unsuitable to their condition.

*Proposed Dietary Scale.*

| ARTICLES.                   | JAILS WHERE DRY GRAIN IS THE STAPLE. |          |            |           |         |           |         |
|-----------------------------|--------------------------------------|----------|------------|-----------|---------|-----------|---------|
|                             | Hard-labor prisoners.                |          |            |           |         |           |         |
|                             | Monday.                              | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. | Sunday. |
|                             | Qr.                                  | Oz.      |            |           |         |           |         |
| Rice...                     | ...                                  | ...      | ...        | ...       | ...     | ...       | 12      |
| Raggy...                    | 16                                   | 8        | 16         | 8         | ...     | 16        | 12      |
| Cumboo...                   | ...                                  | ...      | 8          | ...       | 8       | ...       | ...     |
| Cholum...                   | 8                                    | 16       | ...        | 16        | 16      | 8         | ...     |
| Dholl...                    | 6                                    | ...      | 2          | 2         | 6       | 4         | 2       |
| Mutton...                   | ...                                  | 8        | ...        | 8         | ...     | ...       | 6       |
| Fish...                     | ...                                  | ...      | 6          | ...       | ...     | 6         | ...     |
| Butter-milk...              | 12                                   | ...      | ...        | ...       | 12      | ...       | 8       |
| Ghee ..                     | ...                                  | ...      | ...        | ...       | ...     | ...       | ...     |
| Tamarind...                 | ...                                  | ...      | ...        | ...       | ...     | ...       | ...     |
| Salt...                     | 1                                    | 1        | 1          | 1         | 1       | 1         | 1       |
| Green vegetables...         | 6                                    | ...      | 6          | ...       | 6       | ...       | ...     |
| Plantain or other fruits... | ...                                  | ...      | ...        | 6         | ...     | ...       | 6       |

The quantities here indicated are intended simply for those sentenced to hard labour, and who have settled down regularly to prison life. For under trial prisoners, or those sentenced to short terms of imprisonment, the quantities of both grain and meat would bear diminution to the extent of one-third or one-fourth of the quantities here specified. In jails where rice is the principal grain of the district, it would of course be substituted in part for cholum or raggy, but it would be desirable to introduce

In rice districts, that grain should not form the whole food of the people.

some dry grain for at least one of the meals per diem, as experience shows that nearly all the coast jails have been unhealthy, with an exclusive rice and fish diet. The proportions of carboniferous to nitrogenous nutri-



ment in those diets have been calculated by Dr. Wyndowe as follows :—

|                          | Carb: Nut. |                | Nitr: Nut. |
|--------------------------|------------|----------------|------------|
| Monday.....              | 3·5        | ..... to ..... | 1          |
| Tuesday.....             | 3·2        | ..... „ .....  | 1          |
| Wednesday.....           | 3·2        | ..... „ .....  | 1          |
| Thursday.....            | 2·9        | ..... „ .....  | 1          |
| Friday.....              | 3·8        | ..... „ .....  | 1          |
| Saturday.....            | 3·3        | ..... „ .....  | 1          |
| Sunday.....              | 3·6        | ..... „ .....  | 1          |
| Average of the week..... | 3·3        | ..... „ .....  | 1          |

The cost of these diets will probably be rather greater than of those at present in use, but the large substitution of dry grain in lieu of rice, will allow a considerable margin for the purchase

Cost of the proposed dietary probably greater than at present.

of animal food. In most districts these grains at certain periods of the year can be purchased, in bulk, at a very low rate, and it is a very easy matter to store grain when the consumption is steady and regular. It must be remembered moreover, that the necessity for *extra* animal food with this dietary scale will scarcely ever arise. Whether the cost be

Alteration in diet scales absolutely necessary to maintain the health of prisoners.

increased or diminished, the absolute necessity for a general improvement in the diet of prisoners is evident, if the lives of imprisoned subjects are not to be unnecessarily sacrificed.

Since the substance of this report was written, my friend Mr. Rhode, Inspector General of Jails in Madras, has obligingly furnished me with a copy of a circular recently issued by Dr. Mouat in Bengal, to all Magistrates in charge of Jails. The Circular gives instructions for the purchase and storing of grain, and in addition it recognises the fact, I have tried hard in these pages to establish, viz., that *variety* in the diet of prisoners is more important in reference to the health, than the use of any one food given to the exclusion of others. The portion of the Circular bearing upon this question, I take the liberty of quoting, adding also in an appendix, the useful table prepared by Dr. Forbes Watson, for the guidance of Magistrates in mixing Indian grains, so as to make the mixture equal in nourishing power to wheat. Dr. Forbes Watson's analysis of *raggy*, I may observe, should be received with caution, for the reasons adduced in a for-

mer portion of this report, but in all other respects, the table seems to have been prepared with great accuracy. The superiority of raggy to rice in richness of nitrogen, is abundantly proved by the practical experience of labouring men, and also by the carefully performed analyses conducted by Mr. Mayer in *India*, with good samples of the grain.

“It is a fallacy to suppose that the prisoner needs a more expensive and luxurious dietary in confinement, than when at large. The most wholesome food for him is that to

Dr. Mouat's Circular.

which he has been accustomed from his childhood, and provided it be good and sound of its kind, sufficient in quantity, properly husked and prepared, and cooked with ordinary care, there will be no need to introduce luxuries to which the poorer classes are unaccustomed, on the erroneous plea of their being necessary for health.”

“The next indication to bear in mind is to secure as great a variety of the food grains of your own or neighbouring districts, as you possibly can. The incessant use, without change or variety, of the same articles of food, however good in themselves, is more productive of disease than the use of the coarser kinds of grain, when changed as often as is practicable. But as the different food grains of India vary considerably in their nutritious properties, they require to be combined in different proportions, to secure a really wholesome dietary, in which the elementary principles needed are properly represented. To enable you to accomplish this all-important object, in consultation with the Civil Surgeon, I append to this Circular, a table of the nutritious value of the food grains of India, representing the proportion of carbonaceous to nitrogenous ingredients, and the mixture necessary of pulses rich in nitrogen to be added to substances deficient or poor in that constituent. For the table, I am indebted to the kindness of Dr. Forbes Watson. It has been prepared with the greatest care, and its results may be relied upon.”

“Within the gross quantity of the scale fixed, you are not only at liberty to vary the food of the prisoners as much as the resources of your district will admit of, but I particularly enjoin you to do so—and I am confident that the Civil Surgeon will afford you every aid in regulating the dietary, limited as above noted, so as to secure the highest attainable standard of health, with the greatest economy. With the condiments and fresh vegetables which ought to be furnished by your garden, the cost of the dietary is susceptible of considerable reduction in cost, while its wholesomeness and nutritious value will be increased by the adoption of the measures recommended above.\*”

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\* Circular No. of 1863. Inspector-General of Prisons. Bengal.

In reference to the proposed dietaries, it will be observed that they make no provision for the supply of the class of articles alluded to as nervine stimulants.

Nervine stimulants.

Tobacco, Indian hemp, and betel nut, are used by all classes of the free population. The toddy of the different varieties of palm, either fresh or fermented, is also very commonly used. Distilled liquors are largely consumed by most classes. Opium eating and smoking prevails to a considerable extent in some parts of the country. All these things are rightly considered in the light of "luxuries," and forbidden to prisoners in jails. Those who are employed on works outside the jail walls, and the whole of the hard labor prisoners in the Madras Presidency at present come under this class, have the means of receiving many little extra articles of food, or luxuries, such as tobacco and betel from their friends, and it is sufficiently notorious that they do so receive and use them as opportunities offer.

Supposing prisoners however, to be kept entirely within a jail enclosure, the total deprivation of articles of this class would probably be injurious to health.

Instead of supplying arrack, or betel, or tobacco, it is a question for consideration, whether coffee or tea might not be issued to hard labour prisoners with their evening meals, as a means of preventing undue waste of tissue during confinement.

Use of tea and coffee suggested.

I have not entered into the question as to the propriety of revising the ration list of Sepoys on foreign service, or of effecting changes in Civil Hospital diets, or of the sufficiency of the food laid down by law for emigrants from British India to the Colonies, all of which dietaries are unscientific in composition, and there need be little hesitation in stating, unfitted to support life.

The large mortality of emigrants on long voyages, and of Sepoys on foreign service, I have no doubt is due in some degree to the unsuitableness of the scale of food provided for them. The whole of these dietaries appear to require revision.

The scale of food as suggested by me has already been experimentally tried, with a few modifications under instructions of the Madras Government. The

Account of an experimental trial of proposed diet.

circumstances were briefly these. Owing to the over-crowded condition of the Salem jail, the old debtors jail in Madras was ordered to be fitted up to accommodate one hundred long sentenced men from Salem. These men, in their own district and local jail, had been accustomed to feed upon raggy and cholam, but on arrival at Madras they were subjected to the same diet as short sentenced men in the Penitentiary, viz., rice, dholl, fish, &c.

Under this system of diet the men became unhealthy, and within three months, six of the one hundred had died of diseases of a scorbutic type, such as diarrhoea and general dropsy.

Mr. Shaw, Inspector General of Hospitals, having been ordered to report upon the causes of the great mortality of the Salem convicts, gave a decided opinion that they were losing health in consequence of defective nutrition, and he recommended that the scale of food proposed by myself should at once be supplied to them, with the exception of the fish or flesh, which he thought might be reduced to fifteen ounces per week instead of twenty two. The local Government concurring in this recommendation, directed that the change of diet should be at once carried out.

The prisoners did not much fancy the change. They were dissatisfied with the quality of the rice of their old ration, but they had no notion of going back to the cheaper and more wholesome food which had nourished them all their lives ! Dr. Van-Someren, under whose medical charge the prisoners were, devoted much time and attention to the introduction of the new diet, and notwithstanding a good deal of passive opposition to its reception, he has succeeded in giving it a practical trial. It was found that the prisoners made no objection to raggy, but cumboo and cholam, they said, gave them diarrhoea. It was found on enquiry that these grains had not been properly freed from husk, and that the irritation of the husks had, in a few cases, caused looseness of the bowels. To obviate some of the difficulties connected with the establishment of a new diet, it was determined that *cumboo* should be discontinued, and the experiment carried on with raggy and cholam, thoroughly cleaned of husks. The prisoners finding that the Medical officer was firm in refusing a return to rice diet, became insubordinate. Three or four refused food altogether, and it was not until a little wholesome discipline had been in-

flicted upon the ringleaders, that they one and all gave in and accepted the food provided for them. Upon the authority of Mr. Shaw and Dr. Van-Someren I am able to state, that, since the introduction of the new diet, all the prisoners have improved in flesh and in general health; one or two, who had been so weakened by scorbutic diarrhoea that their recovery was despaired of, have regained their strength. The prisoners are now free from all traces of scurvy.

The best commentary of all, perhaps, upon the change is the fact, that no prisoner who has had the benefit of the improved diet has died in the three months during which it has been in use, (six deaths having occurred in the former quarter) and that there has been no serious sickness since.

From the steady and determined opposition to the reception of the common dry grains in lieu of rice in this instance, I foresee that great firmness and decision will be required on the part of Magistrates and Medical officers in charge of jails, wherever the experiment may be more generally tried. The native convict, incarcerated for his country's good, appears to have two settled ideas. The first is, that he will do no more work than he can possibly help, the second, that he will use his best endeavours to eat plentifully of the kind of food, which, as an honest labourer, would never have fallen to his lot. It is surprising how persistently these ideas will guide all his actions. The slightest derangement of the bowels, or trivial sickness (often purposely induced to deceive the Magistrate or Medical officer) will be attributed to the food, and a return to the old diet will then be earnestly pleaded for. If the prisoner once gains his point in this respect, and is allowed to dictate to the jail officials what his rations should consist of, it will be a hopeless task to bring about any rational system of feeding convicts.

There is one point which, though it has no connection with the scientific view of the subject, I cannot too strongly insist upon.

I allude to the purchase and storing of food grains and other non-perishable articles, by public contract after advertisement, and without the intervention of the native employees connected with the Jail or judicial establishments of the district. I have reason to think that the "money allowance" system is fraught with evil, and, that when the jail servants have any sort of connection with the purveying of provisions, that the interests of Government and of the

convicts are likely to suffer. No experiment in the use of food grains can be said to have been fairly tried, when persons interested in the perpetuation of an old and bad system have been employed in it. I mention the matter here thus plainly, because of its great importance, and that the use of dry cereals in Jails may not be prejudiced in future by parties interested in maintaining things *in statu quo*. It is a difficult matter to effect changes or improvements, when the people cling so strongly to old customs and prejudices, and especially when they oppose innovations by a steady adherence to the policy of passive resistance. Tact and good management on the part of Magistrates and Medical officers, will, when accompanied by firmness and determination to succeed, go a long way in removing obstacles of this kind.

#### IV. THE MODE OF PREPARATION OF INDIAN CEREALS AS FOOD.

The cleaning of food grains is an occupation which falls chiefly upon the women of the country. The operation of husking is both clumsy, and tedious, and withal wasteful. It is generally performed by rubbing the steeped grain in a stone mortar with a wooden pestle, until the husk is separated. There is great room for improvement in the methods of cleaning grain, and there is no doubt that the people often suffer from the use of cereals which have been but imperfectly freed of indigestible husk. The preparation of food is generally simple enough. The grain is either boiled whole like rice, or else it is pounded into a coarse powder, and then made into a porridge, as the Scotch use oatmeal. To the latter, curds, butter milk, and salt are generally added. The mode of preparing food varies somewhat in different districts, but the following examples, culled from the reports of Medical Officers who have investigated the question, are sufficient to show how these things are generally managed.

The native laborers rarely eat more than two meals in the twenty four hours.

Dr. Rean of Chicacole says :—

“ A cooly will usually commence the day with conjee, &c., perhaps a little rice remaining from the last repast of the previous day, he will partake of a substantial mess of raggy in the middle of the day, and at night will take a hearty meal of curry and rice. This is the staple of his nourishment ; if in a state of much poverty, he will be obliged to content himself with a few brinjalls or some suc-

culent vegetable to form his curry with, and an occasional taste of fish or meat."

Mr. F. Day from Cochin on the Western Coast observes that :—

"A labouring native, who is to a certain extent his own master, commences the day by pounding about a quarter of a pound of brown rice, and boiling it in a pint of water, to which some salt is added : some also put in butter milk. He takes nothing else (except perhaps some opium, or a smoke) before ten or eleven in the day, when he expects his wife to have his breakfast prepared. It consists of about a pint of raw *brown rice*\* from Palghaut, which is most carefully boiled, and thus increased to above double, and with it he generally, if near the sea coast, has fish fried in cocoanut oil, or else a fish curry—a curry is made of a little chilli, pepper, tamarinds, salt, &c. and then fried in cocoanut oil. The native Portuguese invariably add to this country vinegar, and some of them eat *white rice* instead of brown, as do most of the Tamil people, who come from the other side of the Western ghauts to reside in Cochin."

Surgeon Fletcher of Cuddapah, states with regard to his district that :—

"The majority of the working classes prepare and eat their food in the form of "sunkaty," which is made by mixing one part of bruised raggy with two of zonaloo, (*Cholum*) and the whole boiled down in a little water to a thick consistence. This is eaten usually with salt, boiled greens, and chillies, or with dholl chatney.

The Mahomedans prepare their meals of zonaloo and raggy principally in the form of cakes and eat them with dholl or vegetable curry. Animal food is not often used on account of its expense."

Mr. Æ. M. Ross gives a minute description of the modes of cookery adopted in North Canara.

"The cookery of a Brahmin's food is very simple as a rule. The rice or other grain is boiled well, or ground and made into cakes, generally the former, and is served on plantain leaves or brass dishes. It is then mixed with curry stuff made very hot (consisting of chillies, coriander seeds) (black pepper seldom), a little scraped cocoanut to flavour it ; rice-flour or cadalays, tamarinds, and onions, with plenty of ghee or cocoanut oil, and eaten in a primitive way with the hand.

Vegetables are always curried, but they are prepared in three ways, either as mulligatawny, dry curry, or fried.

The liquid curry or mulligatawny : The vegetables are cut in small pieces, put into a little water and allowed to boil until they

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\* Some will eat double or treble this quantity, their stomachs being very capacious.

become soft. The curry stuff prepared as above is then added with more water, and the whole is boiled again finally. Ghee or cocoanut oil, in which mustard seeds have been fried, is added liberally, and the dish is ready.

Dry curry is prepared in much the same way, but water is not added with the curry stuff.

Fried vegetables are not boiled at all, but are cut into slices, smeared over with the curry stuff and fried in ghee or cocoanut oil.

As I before mentioned, the vegetables (popularly so called) form the second course.

The above directions, I had almost said contain the whole essence of the Brahmin's cookery book. Such is not the case, however, for they are skilled in the preparation of sweets (composed of sugar, milk, almonds, dates, and so on) into the mysteries of the preparation of which I have not yet been initiated, but of which the Brahmins and Hindoos generally partake largely; especially on the occasion of feasts and festivals. Milk is drunk with their meals, *au naturel*, or as butter-milk, or in the form of curds—of which, as a rule, the people are fond, regarding them also as cooling—the quantity taken as an average may be said to be two or three quarts.

The cookery of the Mussulmans is more complex than that of the European. Elaborate cookery books are printed in the Hindoostani, Persian, and other languages, so voluminous, that it would take very many pages more than can be afforded in a report such as the present, to give even the merest synopsis of one of them.

The Mussulman's dinner consists of several courses, a State affair given by a wealthy man exhibiting far too many dishes to be even enumerated here. In order to give an idea of an ordinary dinner of a well-to-do family of this class, I will endeavour to write out a bill of fare derived from a reliable source, with the mode of preparing some of the various dishes.

*Ash Sungshere.*—Prepare 1 seer each of mutton, tyre (curds) and milk,  $\frac{1}{2}$  seer of ghee or melted butter,  $\frac{1}{2}$  seer of rice, 2 tolahs each of white chenna and blanched almonds, of onions, carrots, pumpkins and bhagee, (greens)  $\frac{1}{2}$  of a seer, of cardamoms and cloves, 1 masha each, of coriander seeds, green ginger, and salt two tolahs each, of cinnamon and black pepper 1 tolah each.

The meat and onions are cut into slices and fried in some of the ghee, the chenna is then rubbed up in a little water, and the whole is boiled until the meat is cooked. The gravy is then strained off, and the meat is fried in more of the ghee with the ground cloves and coriander seeds. The whole is then boiled in a saucepan with the milk and curds, the rice, spices and vegetables are gradually added, the almonds are separately fried, then mixed with the other ingredients, and the whole finally cooked slowly until very much done.



*Briame Noormahalee*.—Cut one seer of meat into slices, rub them over with two or three tolas weight of salt and a little green ginger, then soak them in  $\frac{1}{4}$  seer of tyre for an hour, fry  $\frac{1}{4}$  seer of onions in  $\frac{1}{16}$ th of a seer of ghee until they are brown, then put in the meat and fry it a little; pour over the whole a little water in which one masha of coriander seeds have been ground, then boil until the water is dried up, add one masha each of cinnamon, cloves, cardamoms, haldee and coriander seeds, boil  $\frac{3}{4}$  seer of rice in a little water and add to the meat, colour  $\frac{1}{4}$  seer more with saffron, put with the rest, and cover all with  $\frac{1}{8}$  seer of green cheenna dholl, pour over 1-16 seer of ghee, cover close and cook over a hot fire for an hour or an hour and a half.

All the other dishes are made up equally complex in principle, each generally containing a little of every thing.

They all contain some aromatic substance, the most of them also contain tyre or curds.

The Mussulman curries are not generally so hot as those used by the Hindoos, cakes made of powdered dholl, or other flour, and seasoned with assafoetida, salt, black pepper and other spices, beat very thin, dried and fried in ghee or grilled, are generally eaten with curry.

The bread and cakes eaten by the Mussulmen are generally heavy and rather tough-leavened.

The sweetmeats of which they are very fond, and of which they eat a large quantity, are composed of a great number of ingredients, and have to go through many processes in the course of preparation.

A bill of fare of dinner of a moderately wealthy Mussulman would probably include one or two *ashes* (such as the one for which the recipe is given) one or two pillaus, one or two briames (which partake of the character both of the pillau and of the curry, of which the Noormahalee is an example) two, or three kinds of curry. Beef, mutton, fish, or egg, with popdoms or thin cakes, and numerous dishes of sweetmeats, the whole washed down with sherbets or plain water."

Assist. Surgeon deFabeck tells us that in Kurnool

"Cholum is prepared either to make cakes, or for boiling after the manner of rice. In the former case, the grain having been ground down is mixed with water and baked. In the latter, the grain is first pounded so as to loosen the bran, which by tossing and winnowing is removed; both grain and bran are now well washed, and the supernatant liquor with the bran is removed and the grain dried. The "bran water" is now exposed to the sun and becomes sour; it is thus prepared to be boiled with the grain as rice is boiled. The food, which it is said would otherwise be most insipid, becomes palatable; chillies, &c. are added to make it still more acceptable

A similar mode of preparation is followed both in the district and in the prison."

In Madras Surgeon Aitken shows the mode of preparing rice to be as follows:—

"Rice after washing, to separate sand and other extraneous matters, is prepared by immersion in boiling water, and decoction from about twenty minutes to half an hour, after which it is strained and slightly cooled.

Raggy, cholum, and cumboo are prepared by grinding with water in a large stone mortar, after which the resulting material is boiled to the consistence of dough, from about  $2\frac{1}{2}$  to 3 lbs. of which are considered, on account of its supposed greater nutritive properties, sufficient for a meal with the addition of chatney or pepper-water only."

Assist. Surgeon Wilson informs us that in Madura,

"Raggy is prepared for food as follows:—after being dried in the sun and separated from any impurities such as sand, &c., it is ground into flour between two stones, the flour is then boiled with water and a little salt (like porridge) and is eaten generally with a vegetable curry; this latter is composed of some of the leguminosæ, such as beans or gram, cucurbitaceæ, as pumpkin or water-melon, with chillies. Capsicum annum, a little of the pulp of the fruit of the Tamarindus Indica, and probably some ghee.

This porridge and curry forms the evening or principal meal of the day and is eaten about 8 P. M. The quantity being about half a measure of flour (about  $1\frac{1}{2}$  lbs.) besides the vegetable curry, for an adult man.

The morning meal is prepared somewhat differently, the raggy-flour being boiled in sour conjee-water (or rice-water allowed to stand three or four days, when it takes on a process of fermentation) or sour milk with a little salt. This is not of such a thick consistency as for the evening meal; it is eaten for breakfast at 6 A. M.; a portion of this meal is kept over to be eaten cold at 1 P. M. These meals, morning and mid-day together, comprise about the same quantity of flour as the evening meal.

The porridge is sometimes eaten with sour milk, curry being as a rule only eaten at the evening meal.

Cumboo, (*Holcus spicatus*) is also much used among the agricultural population, and after being dried in the sun and reduced to flour, is sifted to remove the husk or pericarp, and is prepared for food in the same manner and eaten in the same quantities as raggy. This grain contains a considerable quantity of vegetable oil; if bruised and steeped in water for some hours, oil globules will be found floating upon the surface.

Cholum, (*Sorghum vulgare*) is a grain in common use, and is prepared for food in the same manner as raggy and cumboo. Instead of being boiled, the flour of these three millets is sometimes kneaded with water and jaggery, coarse sugar, and made into cakes, being cooked or baked in earthen chatties.

Varragoo, *Panicum frumentaceum*.

Tenei, *Panicum Italicum*.

Samei, *panicum miliaceum*.

Agathy, a grain chiefly used by the weaver caste, and prepared for food by being reduced to flour.

There are several other varieties of the graminaceæ occasionally used for food in the district. The above are the principal grains used in the district as food ; so far as I know, all the fruits of the graminaceæ are dried in the sun, ground into flour by the women between two stones, (an original hand-mill,) and prepared for food by being boiled with water, sour milk, or fermented-conjee-water, and eaten in the form of porridge or made into cakes."

The following is the *modus operandi* in Nellore according to Assistant Surgeon Adam.

"Rice when taken as an article of food, is by different classes of the community subjected to different operations before use. The working and poorer classes of the people, owing to its cheapness prefer the red or coarser kinds of rice, and they do not so thoroughly wash it as do those of better circumstances ; new rice is by them also preferred for food, simply dried in the sun, beaten to husk it, then boiled and used at once. The upper and middle classes of the people, when the rice is taken from the field, bury it in straw under ground. It is kept in this condition for about three months, and by this process it loses in nutritive quality, has the character of old rice, and is considered easier of digestion. After husking, the rice is well washed, boiled and used for food. The better classes throw away the starchy conjee-water, which the poorer classes use as a portion of the meal, and this is sometimes also carefully retained and kept for several days, and used in a fermented state and considered beneficial to health. It is principally in hot weather that this is indulged in. Again the rice washings, before the grain is subjected to boiling, carrying with it a quantity of the starchy particles of the rice, is kept and used in making broth and pepperwater. And I would note that in this district, as also I believe in the more northern countries, the practice of boiling and then drying the paddy before husking is omitted, and a more nourishing food produced than in Madras and other southern parts of the Presidency.

The other grains enumerated as forming the staple article of food are prepared in a variety of ways ; cholum, cumboo, varigaloo, are, after husking and washing, boiled and used as a meal in the same manner as rice. But more generally cholum, cumboo, raggy are

ground in a mill and formed into cakes, sunkatty, or porridge. Arigaloo can only be prepared in the form of rice or porridge. The quantity of these different grains that can be used at a meal varies according to the means of the individual; and of all of them, one seer and a half to two seers of dry grain, or in other words three to four pounds without reckoning condiments, curry-stuff, flesh or vegetables that may be used, is considered a very moderate supply for the twenty-four hours."

Asst. Apothecary Sausman remarks that in Paumbem

"The evening meal is the most important one, and when raggy is used, the flour is either boiled with water into a paste, or made into cakes, and eaten with a curry composed of the pulses or vegetables of the season, and condiments. Cumboo and varragoo are boiled like rice and eaten with the curry, which in either case forms a very small portion of the entire meal, about  $\frac{1}{4}$  of a measure (1 lb. 12 oz.) of any of these grains is about the average daily consumption. The whole of it is prepared in the evening and about three-fourths partaken of, while the remainder is put by for the morning, when it is mixed with water into a kind of porridge, and drunk with either a chilli or a little atchar by way of zest. Occasionally butter-milk or tyre is substituted for the water.

Raggy is most frequently used, rice and animal food are luxuries only indulged in on rare occasions.

In the preparation of their food, the utmost economy is observed, literally nothing is lost; the water in which the grains are boiled is never thrown away, but drunk at the meal or mixed with the portion put by for the morning meal. The curries are prepared by grinding the condiments, mixing them with water, adding the pulses or vegetables, and boiling down to the consistence of a thin conjee as is noticed in their preparation of the other articles of diet."

Asst. Surgeon Crocker gives a detailed account of the plan pursued in the Salem district.

"The *modes of preparation* of those various grains, so as to render them fit for consumption, and adapted to the requirements of Nature, vary very considerably. The first step with reference to all of them is that of being beaten, or pounded in a large wooden mortar, and this is done with a view to the thorough loosening and removal of the husk from the grain itself. This being done, it undergoes a thorough sifting, and in some cases washing, for the purpose of removing the husk or bran as well as dirt and dust.

The subsequent steps differ somewhat according to the grain used, rice for instance is merely washed and well boiled, when it is eaten with vegetable or meat, curry, or "mulligatawny" or pepper-water or milk, or tyre (curdled milk) or whatever the taste of the person

may dictate ; the water in which the rice is boiled being drunk at the time or after the meal is done. Raggy, on the contrary, after being well cleaned by sifting, is dried thoroughly to make it grind more easily, and to secure its reduction to a fine powder by means of the simple method always adopted. A large quantity of this is ground at a time and kept ready for use. There are two methods of cooking this grain, both of which are in frequent use. The first is when completed, somewhat like thick arrow-root conjee, and is prepared as follows :—the fine powder is mixed with a proportionate quantity of *cold water*. It is then placed in the sun and allowed to remain ten or twelve hours. It undergoes during this time slight fermentation and becomes slightly acid and by no means disagreeable to the taste.

Fermentation having been allowed to go as far as is wished, the mixture is then boiled, when it forms a good thick conjee. Rice-flour in small quantity is sometimes boiled with it. This is then called “cooloo,” and is a wholesome digestible and nutritious diet. It is never taken fresh, but is allowed to cool into a jelly and kept for nearly twenty-four hours, and it is then decidedly acid in taste, and this is the favorite way of eating it, a supply is cooked to-day and eaten to-morrow as it were. A second method of cooking this article, and the one generally used by the labouring classes “ryots” and “wudders,” perhaps from the fact of its being less troublesome and not so rapidly digested, is as follows :—the powder or flour being made ready in a suitable vessel, boiling water is poured on it; whilst it is being rapidly and vigorously stirred round with a wooden spoon until the whole becomes a stiff solid mass like pudding. I believe that the proper way however is to sprinkle the flour into the boiling water whilst it is being stirred, and this is continued until by the heat the greater portion of the moisture has evaporated ; it is then removed from the fire, and when somewhat cooled, it is rolled into balls or puddings, the size of a good cocoanut. These are again put into a vessel, and boiling water just sufficient to cover them is poured on them, the vessel is then set aside for twelve hours ; by this time the water becomes acidulated, when it forms a pleasant and cooling drink. With the raggy balls or puddings, various things are eaten, such as ghee, or curry stuff, or pepper-water according to taste. The process is called “cullee.” This is the mode of preparation of the raggy which is adopted in the jail, where raggy for many reasons is wisely used instead of rice.

The mode of preparation of “cumboo” is different from that of raggy. It must be beaten in a wooden mortar moistened with a little water ; so as to make the husk peel off readily, when this is done it is sifted. It is then pounded in the mortar until reduced to powder, and this has to be done in small quantity every time it is required. The process of cooking is similar to that of raggy.”

In Vizagapatam, Asst. Surgeon Andrews tells us

"The poor of the town and its vicinity live chiefly upon cambo, the least nourishing of these articles of diet; it is parted from the husk by pounding, and boiled till it forms a porridge, from 1 to 2 lbs. is taken for a meal, and it is eaten with a curry made of gangrom leaves, (*Canabis sativa*), raw chillies, brinjals, melons and other vegetables. Raggy is the chief food of the hill tribes, it is made into flour, which is steeped in water, till it acquires acidity, then boiled to the consistence of gruel—the gruel thus made is mixed with butter-milk and eaten with vegetable curries, one pound of the grain is about the average quantity for a meal. Cholam is not much used in this district, it is considered more nutritious than raggy or cumboo, and is prepared in the same way as the latter. These people, with the exception of those living in large towns, are at little expense for anything beside the grain, as they cultivate the vegetables, and cut the firewood from the jungles.

III. Mahomedans partake freely of fish and flesh, wheaten cakes and vegetables, and moderately of rice."

In all these modes of preparing food, it will be observed that the cookery, though perhaps rather troublesome and clumsy in operation, is well adapted to render the cereal grains easy of digestion and assimilation.

#### V.—ON THE CONNECTION BETWEEN THE NATURE OF FOOD, AND THE PHYSICAL AND MENTAL CONDITION OF THE PEOPLE.

In concluding this notice of the elementary substances employed as food by the inhabitants of Southern India, the subject would scarcely be complete without a brief allusion to the effects of the various dietaries in a physiological and pathological point of view. Looking to the history of India in past years, we shall generally find that the people who have occupied the rich alluvial plains of the great rivers, or of the sea-board, have, from the profusion of cheap food, increased and multiplied faster than in those districts where Nature has been more sparing of her supplies. Cheap food, notwithstanding the disturbing elements of war, the tyranny of despotic rulers, and the ravages of pestilence, has in all cases tended to favour a rapid increase of population.

The staple food of the people living in such situations has been chiefly rice. In the successive dynasties to which India has been subjected from remote antiquity, each race has had to submit in its turn to the foreign invader. In

adopting the dietary of the conquered people, and feeding upon a grain deficient in those qualities which go to form flesh and blood, the northern invaders have almost invariably become as effeminate as the original occupiers of the soil.

As observed by Macaulay, "It is certain that a succession of invaders descended from the west of Hindoostan, nor was the course of conquest ever turned back towards the setting sun, till that memorable campaign in which the cross of St. George was planted on the walls of Ghiznee."

The fierce and warlike nations which have in past times devastated the rich plains of India, and tyrannized over the defenceless people inhabiting them, have all been consumers of a more nourishing food than rice. It may be safely argued, that if the people had been fed upon the simple diet of the inhabitants of the plains, these conquests would never have occurred. The physical powers and moral courage necessary to the achievement of feats of valour and conquest, have never yet been found in a people who, like the degenerate races in the lowlands, live on grain deficient in nitrogen and eschew animal food.

The physical and mental characteristics of the Bengalees, as painted by Macaulay, are so descriptive in a *physiological* sense, of what might be expected of a people feeding chiefly on a carboniferous diet, that one can scarcely refrain from concluding that they bear the relation of effects and cause.

"The physical organization of the Bengalee is feeble even to effeminacy. His pursuits are sedentary, his limbs delicate, his movements languid. During many ages he has been trampled upon by men of bolder and more hardy breeds. Courage, independence, veracity, are qualities to which his constitution and his situation are equally unfavorable. His mind bears a singular analogy to his body. It is weak even to helplessness for purposes of manly resistance, but its suppleness and its tact move the children of sterner climates to admiration not unmingled with contempt. \* \* \*

Large promises, smooth excuses, elaborate tissues of circumstantial falsehoods, chicanery, perjury, forgery, are the weapons offensive and defensive of the people of the lower Ganges. All those millions do not furnish one sepoy to the armies of the Company."

Without accurate statistics of population it is scarcely possible to say how far the rice eating people of India are wanting in average duration of life. The general impression of Medical Officers who have been brought much into con-

tact with them is, that the value of life is low amongst those who subsist chiefly upon this grain. They become fat, bloated, and incapable of much exertion. This tendency is no doubt increased by the amount of *ghee* and *sweetmeats* consumed. Decay of the vital powers usually sets in early; men become grey headed in early manhood; dyspepsia in its protean forms is a common malady. Furuncular diseases are very frequent among the middle aged, and often associated with diabetes. Diarrhoea, depending upon want of a due amount of nitrogenous nutriment in the food, is often met with, and, in jails especially, cases of this kind are found after death to be marked by extensive ulceration of the mucous surfaces of the large intestine. General dropsy, and a tendency to serous effusions into the cavities of the pericardium, thorax, and abdomen, are only the evidences, as indeed are the other symptoms just noticed, of an impoverished condition of the blood,—of a vital fluid deficient in reparative or plastic material.

Hence, as might be expected, the rice feeders along the sea-board are the chief sufferers from anasarca, and the peculiar affection known as beri-beri. They suffer as a rule rather more from miasmatic diseases, especially intermittent fevers and their sequelæ, than Europeans, or people who live after the European fashion. On the other hand, the natives are good subjects for surgical operation. They recover from the most formidable injuries or operations as a rule much better than Europeans.

From all that has been said on this subject it may safely be predicted, that a people whose chief food is rice is not destined to achieve distinction or fame in the history of nations. Incapable of severe labour, or of the courage and physical capacity for resisting the aggressions of outward foes, or of carrying war into an enemy's country, they will probably remain in the physical condition which Macaulay so truly describes in his picture of the Bengalee. The habits of caste, and customs of forefathers may however be put aside in the progressive development of civilization, and in that case, if the Hindoo of the rice districts can be brought to understand that a due proportion of animal diet is essential to his well being, in eking out the supply of nitrogenous material in which his staple food is so deficient, the future history of the native may be widely different from the past.

Viewing the other side of the question, we observe that



the warlike invaders who from time to time have overrun the plains and valleys of the rice producing districts, have invariably come from localities where a richer diet is used. The Affghans, Seiks, Beloochees, Rajpoots, Malharrattas, Rohillas, Mysoreans, and in fact every people who have ever conquered the lowlands of India, have acquired their chief sustenance from food superior in nutritive value to rice.

It is often argued that climate is the chief cause of the observed differences in the characteristics of the people inhabiting the hills and table land of India, and that food is only of secondary importance in producing them, but from a due consideration of the matter in all its bearings it seems that climate, except that it influences very materially the natural products of a district, does not affect the mental and physical characteristics of a people so much as has been generally supposed. This is scarcely the place to enter upon the question of the influence of *race*, in accounting for the observed differences in the inhabitants of the high and low lands of India. The influence is no doubt very important, but it does not materially affect the general principles here laid down.

The supposed "fact" that the natives of India lived exclusively upon a highly carboniferous diet has always been an anomaly in physiology. If the deductions from our present knowledge of the laws of life are correct, less carboniferous material is required by the human body in hot countries than in cold, but we have already seen that the rice eating population consume an undue proportion of that material.

It has also been shown I think most conclusively that they do so at the expense of their physical strength, capacity for labour, and chance of a long and healthy existence. The anomaly disappears on close investigation, and physiological laws are shown to admit of no exception.

The use of animal food by Europeans in tropical countries, except in very moderate quantities, has been condemned by some medical authorities of repute, on the ground of its predisposing to diseases peculiar to the country. The reasoning by which such an opinion has been arrived at does not appear however to be very logical. In the first place we find in the animal kingdom that all the larger flesh-feeding animals are inhabitants of the tropics. Secondly, that man's instinctive feeling, if it be not interfered with by civilization, is to eat

plentifully of animal food. In central and southern Africa, the various Kaffir tribes will gorge themselves with flesh whenever they have the opportunity. To such an extent does the desire for animal food proceed in some districts, that it amounts to a positive disease, the symptoms of which have been well described by Livingstone, Du Chaillu, and other African travellers. The inhabitants of the Fan country rather than deprive themselves of animal food, indulge in cannibalism of the most revolting forms. The aborigines of the Andaman Islands, (who according to Professor Owen are probably the remnant of a primitive and otherwise extinct race of mankind) although living under a fierce tropical sun, and in the midst of moisture and vegetation, subsist almost entirely upon fish and the flesh of the wild pig. They do not cultivate, and the few who have been brought in contact with the officials of the Penal Settlement on the Islands, exhibit a great repugnance to the use of vegetable food. The aborigines of Australia are chiefly animal feeders. The Chinese, Malays, and Burmese eat a greater variety of animal food than do the nations of the West. The American Indians live chiefly on the produce of the chase. So do all the hill and jungle tribes in India.

All these people are large flesh eaters, and they live and thrive in countries which are as hot and moist as the plains of Bengal. If animal food can be so largely assimilated by these various races without injury to health, it seems scarcely fair to charge the prevalence of disease amongst Europeans in the tropics to its liberal use.

The conclusion to be arrived at from a consideration of all these facts is, that when Europeans are called upon to undergo active exertion in a tropical climate, the waste of their bodies is best met by a plentiful supply of animal or other highly elaborated food, and that instead of being injurious, it is the aliment most plainly indicated by nature as the safest and best. Food of this kind is essential to those who live an active life in the open air. It is only injurious when indulged in to excess by those who dwell in darkened and ill-ventilated apartments, as many of our soldiers do, and who at the same time take little or insufficient exercise.

It has been observed that tigers and cheetahs are found to die of abscess of the liver when shut up in cages in this climate, and thus deprived of their natural exercise. These

causes probably operate in producing liver disease among the European residents in India. A remarkable instance of the converse of this is afforded in the history of the Madras Fusiliers during the memorable campaign of 1817 in Bengal. The regiment for months together underwent the greatest amount of peril and hard work in field and garrison. War and pestilence played great havoc in the ranks of the corps; but with all the exposure to climate, changes of temperature, excesses in eating and drinking, want of clothing, and occasional scanty fare incidental to field service, there stands out the remarkable fact, that not a single man died of abscess of the liver.

The use of malt liquors again has been advocated on the impression that they are better suited for residents of hot climates, than wines and spirits. But the fact is, that where one man is benefited by drinking beer, many more have their digestive organs deranged by it.

I allude specially to the strong ales brewed for exportation, which contain too large a proportion of carbonic and extractive matter to be thoroughly wholesome in a tropical climate.

Beer drinking amongst old Indians is gradually passing into disuse, for the reason that light wines are generally found to be better adapted to the preservation of health in a climate where so many old residents suffer from weak digestive power.

In concluding this report, I must crave the indulgence of my professional brethren for having treated them to so elementary physiology. I have been obliged to do so, so that the subject might be comprehended by persons unacquainted with the principles of that branch of science. I hope that in this respect I have succeeded in making the subject clear. If the better understanding of the subject should lead to a rearrangement of Prison dietaries in the Presidency, the purpose for which the report was written will have been accomplished.

[NOTE.—At a subsequent page of this volume will be found a list of European and Indian vegetables suitable for food, drawn up by Mr. Balfour, Inspector General of Hospitals. Instead of reprinting the list as annexed to this paper, I beg to refer the reader to the original.—W. R. C.]

that contains matter as found in Wheat, viz. 6 : 1.

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|---------------------------------|---------------|----------------------|---------------------------------------|----------|----------|
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| iches<br>loris.<br>dras<br>orse | chos<br>rmis. | Lathyrus<br>sativus. | Soja hispida.<br>Bhoot—Catjung Tahoo. |          |          |







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HEALTHY CHOROID WITH PAPER, MADE IN 1898

**ART. II.—Contributions to Ophthalmic Medicine and Surgery.** By GEORGE SMITH, M. D., Professor of Ophthalmic Medicine and Surgery, Madras Medical College, &c.

SECOND SERIES.

**I.—Remarks on the Ophthalmoscopic appearances of the Fundus Oculi in the native of Southern India.**

I HAVE much pleasure in being able to lay before the readers of this Journal two chromo-lithographs, the upper one representing the fundus of the European eye, and the lower one the fundus of the eye of the native of this Presidency, as revealed on ophthalmoscopic examination. The lithograph of the European eye is copied from Mr. Hulke's work on the Ophthalmoscope, that of the native eye has been copied from a drawing, taken at the Eye Infirmary under my direction.<sup>(1)</sup>

The contrast is certainly remarkable, presenting as it does two very different normal standards by which to judge of pathological aberrations in the eye of the European and of the native of India.

It may perhaps be well to recall briefly a few of the principal facts connected with the anatomical structure of the organ of vision, in so far as these facts seem to be involved in our remarks upon ophthalmoscopic appearances.

The coats of the eye are three in number, the sclerotic, choroid and retina, the last named being the most internal of the three.

The retina is a transparent organ of complex structure. A section of it placed under the microscope presents internally a layer bounded by a limiting membrane, formed of the fibres of the optic nerve; external to which is observed a stratum of nerve cells, backed by a complex granular layer, and most external of all, the peculiar structure called Jacob's membrane, consisting of delicate cones and rods placed at right angles to the granular layer, and maintaining close connection with the cells of the pigmentum. Passing vertically through the complex structure of the retina are seen delicate fibres, the fibrils of Müller. In the

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(1) I may mention that these chromo-lithographs have been executed by Mr. Barren of this city, who deserves much credit for the success with which he has accomplished the task entrusted to him.



structure of the retina ramify the delicate branches of the retinal artery and vein, which, near the optic disc lie superficially, dipping, however, more deeply into the retinal structure, as they recede from the locality of the optic papilla.

External to the retina lies the choroidal hexagonal epithelium, resting "upon a delicate membrane of great tenuity," which, Mr. Hulke informs us, resembles, in the absence of all traces of structure and in its chemical reactions, the elastic lamina of the cornea.<sup>(1)</sup> This pigment "is less abundant over the larger vessels than elsewhere." The hexagonal-celled pigment layer is, as we shall presently see, a most important element when taken in connection with the ophthalmoscopic appearances of the fundus oculi. External to the pigment layer lies the chorio-capillaris or capillary layer of the choroidal stroma, behind which again are found the larger arteries (Tunica Ruyschiana) and veins of the choroid, the former running in straight lines, whilst the latter are arranged in vortices (vasa vorticosa); the interspaces of the vessels being filled up with multipolar-pigment cells.<sup>(2)</sup> External to the choroid is observed the fibrous sclerotic, which is attached to the choroid through the medium of a delicate layer of connecting tissue, presenting a yellowish or fawn colored tinge, the "*membrana fusca*" of the older anatomists.

In the axis of the eye is seen, on the surface of the retina, the macula lutea, the optic disc being distant from it about  $\frac{1}{16}$ th of an inch towards the nasal side, and on a lower level. The optic disc constitutes the central and starting point of ophthalmoscopic examination.

From this brief sketch, and bearing in mind the transparency of the retina, the dark hue of the hexagonal pigment, the curiously disposed vessels of the choroid with their intervascular pigmented spaces, and, last of all, the silvery lustre of the sclerotic dulled by its fawn colored lining, we shall be able to form a tolerably correct mental image of the tableau revealed by the ophthalmoscope, when the fundus oculi is lighted up through the dilated pupil. If we desire to understand

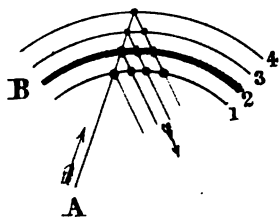
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(1) Hulke on the Morbid Anatomy of the Choroid and Retina. Ophth<sup>c</sup> Hospital reports, vol. 1, p. 68.

(2) Mr. Nunneley denies that these are really stellate pigment cells. See "*Organs of Vision*," page 170.

the course of the ray of light projected into the eye by the mirror, and in what way, by the several processes of transmission, reflection and absorption that ray illuminates and renders visible the structures of the fundus, we should refer to Rainy's treatise on the Ophthalmoscope, and study, more especially, the following lucid passage. "If we trace the course of the light sent from the ophthalmoscope after it has passed through the refracting media, it must be observed that it first meets with the retina, which being smooth and transparent, reflects but little light, either regularly or irregularly, when the light falls nearly horizontally on its surface, as it must of necessity do. It next reaches the layer of hexagonal pigment-cells covering the choroid internally, when a considerable proportion is absorbed, some is transmitted and a good deal seems to be reflected. The transmitted light arrives at the choroidal vessels in the next place, and some is reflected, some transmitted and some absorbed. The pigment in the interstices between them will, if strongly developed, absorb most of the light which falls upon it, but some may be transmitted through both it and the vessels, and the sclerotic, which has a great reflecting power. The light returning from these more deeply seated parts suffers loss from absorption in passing again through the more superficial ones; and it is also dispersed by them, in such a way, that it rather tends to affect the color of the latter and the apparent brilliancy of the image which we see, than to give us a definite perception of the form and color of the objects from which it is reflected. The less strongly developed the superficial pigment is, the less absorption and dispersion will take place."

Let me illustrate by a rude diagram Mr. Rainy's explanation.



Let A be a ray of ophthalmoscopic light impinging upon B, the fundus oculi, and passing successively through 1, 2, 3, 4, the retina, pigment layer, choroid and sclerotic of the eye; let the reflected lines represent the returning rays, and the series of dots upon the several lines, the points at which certain proportions of the rays are absorbed. The ray A imping-

ing upon the retina passes through it, very little of the ray in the European being either absorbed or reflected ; it then reaches the pigment layer, where much is absorbed, some is transmitted, and a considerable proportion is reflected ; the ray passes next to the choroidal vessels, and the same processes of transmission, absorption and reflection are repeated ; the absorption and reflection being greatest where the multipolar cells exist. The ray, much diminished in intensity, reaches the highly reflecting inner surface of the sclerotic, and returns again through the layers already named, losing, in its transit by absorption, and so failing to illuminate the tissues sufficiently to enable us to have " a definite perception of the form and color of the objects from which it is reflected."

From what has been said, it becomes evident that the penetrating and illuminating power of a ray of light falling upon the fundus, will be influenced, most essentially, by the amount and distribution of the pigment cells in the proper pigment layer, as well as in the intervascular spaces of the choroidal stroma. Hence we must expect to find the greatest possible difference in the tableau of the fundus, as seen, for example, in the eye of the Albino, of the native of Britain, and of the negro.

A recognition of this fact, and an intelligent appreciation of these differences, will enable us to recognize the normal appearances of certain eyes submitted to examination, as well as to detect, in others, the unusual colorations resulting from pathological changes.

If we wish to inspect the several tunics of the eye as far as, and even into the sclerotic itself, we must select the eye of an Albino for the experiment. In such a case the total lack of coloration (dependent upon the absence of hexagonal-cell and stellate-cell pigment) enables us to see by transmitted and reflected light, with the minimum of absorption, the retina, the vascular choroid, and the silvery sclerotic lustre, shining through the uncolored inter-vascular spaces ; nay more, Dr. Liebreich has shewn that, in the case of the Albino rabbit, the long ciliary vessels themselves, lying between the choroid and sclerotic, may be traced even when they dip into and traverse the sclerotic itself. I have not yet had an opportunity of examining the eye of a per-

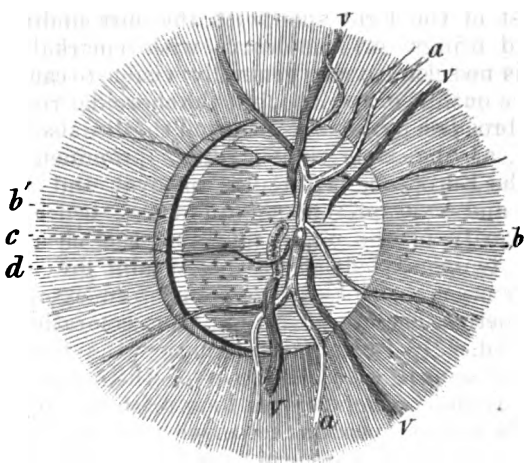
fect Albino in India, but, in the case of a semi-albino laborer, I found the ophthalmoscopic appearances to be as follows :—"On directing the specular light into the eye, a very rich red glow was observed. The fundus oculi was very distinctly seen, and its minutest vascularity was clearly discernible. The optic disc was circular, bluish-white circumferentially, and of a purer white in the centre. The choroidal vascular net work was very distinctly seen, the arteries, from their direction being readily distinguished from the veins. The choroid presented a most beautiful sight, the inter vascular spaces being lit up by the silvery reflection of the sclerotic. The vessels, however, which course through the sclerotic structure were not visible. No pigment was any where observed in the fundus, though its entire absence was hardly to be expected, considering that the iris possessed a certain amount of uveal coloration, and the skin of the individual, as well as his hair, were not entirely destitute of pigment tissue.

On dilating the pupil of the European eye with atropine, and directing into it the specular light, we remark a rich warm furnace-like reflection, which is very characteristic. When the eye of the person examined is turned a little (Liebreich says  $50^{\circ}$  to  $20^{\circ}$ ) towards the nasal side, the disc of the optic nerve comes into view ; it is circular or ovoid ; pinkish ; more vascular on the nasal side, lighter in color on the temporal, and often with a still lighter spot at the point of the emergence of the retinal arteries and immergence of the retinal veins. From this disc, at times a little excentrically, rises the retinal artery, dividing into branches which are distinguishable from the veins by their smaller size, double contour and brighter red color ; into this disc subside the veins, known by their larger size, single outline, more superficial position and purple color. Small arteries traverse the nasal side of the disc giving it a pinkish hue, whereas, as already said, the temporal half, being comparatively free of vessels, is distinctly lighter in color.

The following sketch, copied from Dr. Liebreich's admirable Essay "*De l'examen de l'œil au moyen de l'ophthalmoscope*," (which serves as an introduction to Warlomont and Testelin's French Edition of Dr. Mackenzie's work on Diseases of the Eye,) illustrates the usual arrangement of the arteries and veins of the optic disc, as well as the ap-

pearance of the sclerotic and choroidal rings which surround it.

(1) a. a. arteries ; v. v. v. veins ; b. the contour of the



optic disc, situated on the plane of the choroid ; b' a greyish choroidal crescent, often seen in the healthy eye ; c. a fine and very clear arc, generally placed parallel to the optic disc, and caused by the luminous rays reflected by the tunic of the optic nerve, at the point where this latter is continuous with the sclerotic ; d. the delicate greyish tint of the proper nervous tissue of the disc. The brilliant network of the surface of the optic disc, is due to the nervous elements retained in position

by the cribriform fascia. The choroidal and sclerotic arcs, are generally spoken of in English works, under the names of the choroidal and sclerotic rings.

Leaving the optic disc, the arteries, on the nasal side, traverse the fundus without adhering to any fixed direction ; on the temporal side, however, they sweep so as to avoid the macula lutea, which remarkable spot is only supplied with capillary vessels.

In the European eye, the retina, transparent, and having no dark background whence the light being reflected may be retransmitted through the transparent tissue, is detected with difficulty, though its vessels are very clearly recognized. The pigment tissue, however, is sufficient, if not to form a background for the retina, at least to conceal the details, though not the coloration of the choroid, which the sclerotic reflection presents to the eye as a rich orange-red and equally diffused tint. Mr. Hulke's chromo-lithograph, which I have copied, is upon the whole a very faithful representation of the normal fundus of the eye in our countrymen.

In the native of India again, when, through the dilated

pupil the specular light is thrown upon the fundus oculi, the reflection presents a warm tint, much dulled with an inky wash. In some instances a cold inky reflection is alone observed, especially where the coloration of the skin is strongly marked. When the optic disc comes into view, the contrast of the light spot with the surrounding dark background brings out the details with remarkable clearness; there is no sclerotic ring generally visible to cause irregularity of the outline of the disc, but the choroidal ring, in the form of a broadish dark band, maps off the disc sharply, and gives it, at the same time striking prominence. The disc, as in the European, is circular or oval, and the details of artery and vein present no difference; beneath the pink vascularity of the nasal side and the clearer brightness of the temporal half of the disc, a faint greyish wash is generally seen, except at the point of emergence of the arteries, where a brighter spot, free from coloration, is usually observed. By "direct" examination, the fibres of the optic nerve can be seen passing over the edge of the disc into the retinal structure, and long filaments, like silver striæ, can be traced towards the periphery,<sup>(1)</sup> in company with the branches of the retinal artery. The retina, though as transparent as in the European, does not appear to be so, inasmuch as its structure, laid as it is upon the dark back-ground of the pigment layer and seen by direct as well as by immediately reflected light, becomes beautifully apparent, and, except in the direct focus of the ray, exhibits the appearance of a French-grey colored haze or of a cloud of delicate semi-transparent mucus. To the retina the pigment layer forms a back-ground, which entirely conceals, in the normal state, all details of the choroid, the only feature observable being a very fine black stippling, due to the presence of the hexagonal pigment cells. The darker the pigment layer, the more opaque looking and apparent becomes the retina; on the other hand, when the layer of pigment is moderate in color, still more when, from disease it becomes atrophied, the retinal tissue appears more or less transparent, and the details of the choroid becomes visible. The macula lutea, which is seen with difficulty in the European eye, is, judging from my own experience, discerned with still greater difficulty in the eye of the native

(1) I have seen it remarked, that these striæ which affect the company of the retinal arteries are probably pathological appearances; in the case of the native, I am satisfied, that they are physiological and normal.

of India. I have searched carefully for it in the normal eye, but have hitherto failed to detect it; only once, and that, in an eye suffering from atrophy of the pigment layer, have I been able to satisfy myself of its locality.

Before I quit this part of my paper I may remark, that the chromo-lithograph would have been more true to nature had the lithographer succeeded in spreading over the fundus, except in the immediate neighbourhood of the optic disc, the semi-opaque, French-grey haze, of which I have spoken.

It may be supposed, on looking at the beautiful illustrations of Eye disease as revealed by the ophthalmoscope which adorn recent works on ophthalmology, that similar objects of interest must be denied to the student of diseases of the eye in the native of this country, but this, I opine, is a mistake; once the observer becomes accustomed to the sombre tint of the fundus oculi of the native, once an accurate knowledge of the normal appearance and normal variations of that fundus is acquired, the ophthalmoscopist will find pathological tableaux of the most interesting kind meeting him at every turn, and offering to his contemplation a new, an interesting and, comparatively speaking, an untrodden field of study and discovery.

## II.—*Notes of Twenty cases of Cataract treated by Extraction.*

The following cases of cataract treated by extraction constitute the first twenty submitted by me to this operation, and are recorded in abstract, in the order in which they were operated upon.

I.—DOUBLE CATARACT.—Bastian, *Æt.* 70, male, Pariah. Admitted 22nd July 1863. Both lenses affected; right lens more advanced than left; pupils clear; no adhesions. The cataract a nuclear one, with a homogenous non-fibrous periphery of a softish consistence.

*August 25th.*—To-day the right lens was removed by extraction, the conjunctiva being held with forceps as advocated by France. The operation was free from difficulty or complications. A horse-hair stitch was passed through the skin of the lids of each eye.

*28th.*—Today the stitches were removed. The corneal section was found lying in its right place; anterior chamber full of aqueous humour; no pain; no discharge. Patient has been well fed.

*September 4th.*—The section of the cornea has not yet completely united ; there is a minute ulcer in the centre of the section, close to the edge of the flap. Weather unsettled ; bark and acid ; good food ; arrack  $1\frac{1}{2}$  measures daily.

*October 17th.*—Discharged cured. Vision good ; a very slight film, hardly visible, somewhat dulls the sharpness of sight. Was advised to return after the rains should the dimness continue.

II.—DOUBLE CATARACT.—Vencatachellum, *Æt.* 46, male, Hindoo. Admitted 1st July 1863. Both lenses affected ; right cataract more advanced than left ; the right lens exhibits a nuclear cataract with soft and indistinctly fibrous cortex ; a brownish reflection proceeds from the nucleus of the lens ; pupil dilates well. Both eyes have the arcus senilis well marked.

*August 28th.*—Today the right lens was removed by extraction, the conjunctiva being held with forceps : no difficulty or complication. A horse hair stitch was inserted.

*September 1st.*—The stitch was removed. The aqueous humour was found to have been regenerated ; a little soft lenticular matter appeared in the upper part of the anterior chamber ; no pain or congestion.

*13th.*—Corneal wound healed, except a groove externally in the corneal tissue.

*27th.*—Discharged cured with excellent vision. This patient was treated with good diet and arrack.

III.—DOUBLE CATARACT.—Mrs. Flood, *Æt.* 62, an European born in India. Admitted 27th August 1863. Both lenses affected ; noticed impairment in the vision of the left eye first ; lenses present hard nuclei with a brownish reflection and surrounded by soft, opaque, and indistinctly fibrous peripheries. General health pretty good.

*September 16th.*—Extraction was performed on the right eye by France's method ; no mishap occurred. Straps were applied ; no stitch was introduced.

*20th.*—The straps were removed ; a little lenticular matter in the anterior chamber ; eye doing well.

*October 13th.*—Discharged with useful vision. Mrs. Flood has since returned to hospital to have a small remaining piece of capsule removed. The result of the operation will be given on some future occasion.



IV.—DOUBLE CATARACT.—Lutchmee, *Æt.* 55, a female Hindoo. Admitted September 7th, 1863. The right eye was first affected. Lenses present condensed nuclei with circumferential soft, non-fibrous, lenticular matter.

*September 16th.*—Extraction was performed; no difficulty occurred. A horse hair stitch was inserted.

*20th.*—A little lenticular matter in the anterior chamber; a minute prolapsus of the iris; corneal flap looking well.

*29th.*—The prolapsus was touched with a fine pencil of caustic.

*October 12th.*—Discharged with very good vision.

V.—DOUBLE CATARACT.—Wm. O., *Æt.* 64, East Indian. Admitted 5th September 1863. An old man, much broken down physically and mentally and showing evidence of incipient general paralysis. Vision of the right eye failed first.

*September 16th.*—Extraction was performed; no complication. The lens was dense and of an amber color.

*20th.*—Today the bandage and straps being removed the corneal section was found to be doing well.

*October 6th.*—Slight catarrhal ophthalmia has attacked both eyes.

*31st.*—Vision remarkably good; discharged and readmitted at his own desire, to have the left eye operated on.

VI.—DOUBLE CATARACT.—Paupah, *Æt.* 58, female Pariah. Admitted 22nd May 1863. The pupils when dilated with atropine shew nuclear cataracts in both eyes. In the left eye the cataract is still nuclear; in the right lens both nucleus and periphery are affected; the lenses are of a dirty greenish drab color. The patient is an emaciated, starved and wrinkled woman.

*June 22nd.*—The operation for anterior solution was performed on the right eye.

*July 30th.*—Patient had an attack of catarrhal ophthalmia in both eyes.

*August 14th.*—Anterior operation for solution repeated.

*September 2nd.*—No great change apparent, but the patient fancies she can see better.

*24th.*—The process of absorption being utterly unsatisfactory, the lens was removed by extraction. The operation was free from difficulty or complication; a horse hair stitch

was passed through the lids of both eyes. The lens was found to have undergone very little change in consequence of the double anterior operation for solution.

28th.—Stitches removed ; eye doing well.

October 6th.—Had an attack of catarrhal ophthalmia of both eyes.

29th.—Discharged well, with useful vision.

VII.—MONOCULAR CATARACT.—Nynatha, *Æt.* 50, female Pariah. Admitted 20th August 1863. A year before admission the left eye had been operated on by a native oculist. Pain and inflammation have been present in the globe ever since, and now the vision of the eye is seriously impaired. The right lens presents a hard nuclear cataract with striated periphery.

September 24th.—The right lens was removed by extraction, without difficulty or mishap. A horse hair stitch was inserted.

October 3rd.—Cornea hazy ; no pain ; has some vision, but sees imperfectly.

26th.—Eye improving slowly ; some soft lenticular matter in the anterior chamber.

November 7th.—Eye doing well, but some persistent congestion.

December 6th.—Discharged with useful vision.

VIII.—DOUBLE CATARACT.—Polliam, *Æt.* 66, female Hindoo. Admitted 30th July 1863. States that until a year ago she has been able to go about and perform her house work. Her sight has become much impaired ; she can just distinguish day from night, and see the flame of a candle or lamp. The cataracts are cortical and soft, and have a spermaceti lustre.

August 1st.—The left lens was operated on for anterior solution.

14th.—Operation repeated.

29th.—A distinct perforation through the body of the lens ; she avers that she can see light with this eye.

September 24th.—Extraction was performed on the right eye. The globe was deeply sunk in the orbit, and the palpebral fissure being very small, I experienced some difficulty in making the incision. The pupil, on the section being made,

contracted very much, and proved an obstacle to the use of the cystitome. After lacerating the capsule, the lens refused to start on moderate pressure, and it became evident, either that the pupil was much too small or that adhesions existed. After a further fair trial I snipped the iris with an iris scissors, and attempted again to start the lens by pressure; this attempt failed, and as some vitreous humour was threatening to escape, I abandoned the pressure, and tried to bring the lens out with the lens hook. Adhesions, however, prevented this being successful. With the curette I scooped out the lens, using gentle force in separating the adhesions. After removing some lenticular matter from the anterior chamber, and from between the lips of the incision, a horse hair stitch was inserted into the lids. No pain or inflammation followed the operation.

*October 20th.*—Eye looks quite normal; cornea has healed; pupil clear *but retina insensible to light*. On instituting a close examination, it was found *that the left retina also was insensible to light*, and it became evident that the patient had feigned an amount of perception of light which she did not possess. The operation was successful *as an operation*, though its results in no respect modified the hopeless blindness of the patient.

*November 15th.*—Discharged.

**IX.—DOUBLE CATARACT.**—Luchmoonen, *Æt.* 58, male, Pariah. Admitted 15th July 1863. This patient is a sickly anemic looking man with lack-lustre skin, and presenting evidences of antecedent syphilitic ulceration of the fauces. In the right eye there is a cortical cataract of a greyish blue color, indistinctly fibrous; in the left eye the lens has a spermaceti lustre, and distinctly striated structure.

*August 1st.*—The anterior operation for solution was performed on the right eye.

*5th.*—Catarrhal ophthalmia attacked both eyes.

*24th.*—Operation repeated.

*September 24th.*—The lens of the right eye, which had undergone but little change, was extracted, as usual, by the upper section. The operation was a difficult and delicate one, as the eye was a deep-set one. A horse hair stitch was inserted.

*27th.*—On opening the eye to-day the corneal flap was

found unadherent and infiltrated with pus ; no pain ; some purulent discharge.

*October 3rd.*—Cornea quite opaque ; no pain ; no vascular excitement.

*November 7th.*—Right eye collapsing ; vision entirely lost.

**X.—DOUBLE CATARACT.**—Francis, *Æt.* 60, male, native Christian. Admitted 27th August 1683. Has done no work for two years. Cataractous lenses in both eyes. The cataracts are nuclear with tolerably clear peripheries. The reflection of the cataracts is of a bluish-grey. The cataract of the right eye is the more advanced of the two. General health good ; is a very timid man.

*August 31st.*—The operation for extraction of the right lens was commenced, but before counter-puncturation could be effected the eye swept rapidly towards the inner angle, and the aqueous humour escaping, made it unsafe to continue the section. The knife was withdrawn and the patient sent to bed.

*September 2nd.*—Aqueous humour regenerated ; eye quiet ; slight vascularity.

*24th.*—The cataractous lens of the right eye was extracted, but with considerable difficulty, owing to the great unsteadiness of the patient. The iris too fell forward, though not *upon* the edge of the knife, and the difficulty was further increased by my assistant losing hold of the conjunctiva (France's operation) ; at the same moment the eye became unsteady and rolling up behind the upper lid, forced me to cut out too soon, thus making a rather short and irregular flap. The lens passed out without difficulty ; a horse hair stitch was inserted in the lids.

*30th.*—Eye doing well, but a tendency to prolapsus iridis exists.

*October 1st.*—The section has not healed, the iris having prolapsed a little. Under the repeated gentle application of lunar caustic, the prolapsus subsided, and the iris became incorporated at the line of section with the edges of the cornea. An extensive anterior synechia was thus formed, a delicate black line shewing the site of the union ; the pupil, however, appeared contracted and blocked up with a band of opaque matter which passed from within the pupil to the inner surface of the corneal section. All pain ceased ; vascularity gradually diminished, and the slight opa-

city of the corneal margins gradually became less, but vision was restricted to a perception of the difference between daylight and darkness.

*January 2nd, 1864.*—An attempt was made to remove the opaque band, but it proved unsuccessful; no pain or vascularity followed the operation.

*22nd.*—An artificial pupil was formed downwards and outwards; there is promise of vision being restored.<sup>(1)</sup>

**XI.—DOUBLE CATARACT.**—*Arnagherry, Æt. 60, male, Hindoo. Admitted 2nd September 1863.* Both lenses are cataractous; the degeneration is incipient, that of the left being the more advanced; the cataract is apparently cortical and non-fibrous. The eyes are much sunk in their orbits, and the orbits are remarkably small. General health good; arcus senilis present.

*September 29th.*—The left lens was extracted by the lower section; an assistant having raised with a speculum the upper lid, I laid hold of the conjunctiva below and close to the cornea with a dissecting forceps, and without difficulty accomplished the usual section. The lens had a hard nucleus, enveloped in a soft periphery. A horse hair stitch was passed through the lids.

*October 2nd.*—The stitch was removed and the section found to be doing well.

*10th.*—Catarrhal ophthalmia attacked both eyes and occasioned some anxiety, especially as the cornea became slightly hazy; subsequently this haziness subsided, but the edges of the section remained white and indisposed to unite firmly. Improved diet with arrack and bark with acid, however, assisted the vital powers, and on the 17th November he left hospital with good vision.

**XII.—DOUBLE CATARACT.**—*J. M., Æt. 54, East Indian.* Has only the perception of light in the right eye; less impairment of vision of the left. Under atropine the right pupil dilates freely and reveals a dark brown streaky cataract with a hard nucleus and soft periphery; very prominent arcus senilis. General health at present good; is a fat man with feeble heart and small pulse, subject to attacks of asthma, complicated with hepatic derangement. *J. M. having*

(1) This patient became tired of his long residence in Hospital and left by his own accord within a fortnight of the last date mentioned here; vision was decidedly improving when he left.

been prepared for the operation, it was performed on the 2nd October 1863, the day of his admission to Hospital. The operation was the usual one by the upper section, and no difficulty or complication attended its performance. Every thing went on favorably, and he left hospital with good vision on the 12th of October. A severe pulmonic and hepatic attack followed, which placed his life for a time in danger, but he recovered, and is now in perfect health; his eye stood the test of the severe cough and asthma well, and his vision continues excellent.

**XIII.—DOUBLE CATARACT.**—Moothoo, *Æt.* 60, male, Hindoo. Admitted 5th October 1863. The pupils dilate well under atropine and reveal two cataracts, of which the right is the more advanced. They are both nuclear, amber colored cataracts with white, granular and softened peripheries, obscurely fibrous in the case of the left lens. An old man; not anemic; health good.

*12th October.*—The lens was removed by extraction from the right eye and by the upper section. A horse hair stitch was passed through the lids.

*15th.*—The stitch was removed and the section found to be doing well.

*23rd.*—Slight congestion of the conjunctiva of both eyes; otherwise doing well.

*31st.*—Discharged with good vision.

**XIV.—MONOCULAR CATARACT.**—(The cataractous lens of the right eye was removed by extraction on the 28th of August, vide case No. 2.)

*October 12th.*—The left eye was submitted to operation by the inferior section. Operation unattended with difficulty or complication. A horse hair stitch was introduced. The lens was a nuclear one, amber colored, and with a soft periphery.

*15th.*—Stitch removed and flap doing well.

*17th.*—Slight prolapsus of the iris.

*20th.*—Prolapsus on the increase.

*23rd.*—Prolapsus is considerable, and the edge of the lower lid acts injuriously upon the cut corneal margin, preventing union and facilitating further prolapse. The process of recovery was slow, but ultimately the incision healed with an anterior synechia and slightly dislocated pupil, but with good vision. He was discharged on the 16th

of January 1864, the operation having succeeded well in both eyes.

XV.—DOUBLE CATARACT.—Poonen, *Æt.* 65, male, Pariah. Admitted 21st September 1863. This patient had evidently been suffering from want; he was anemic, but otherwise did not appear to be in bad health. With the right eye he can see to find his way about, but with the left he can only distinguish day from night. Both lenses presented nuclear-cortical cataracts, that is, they had amber tinted nuclei with soft peripheries. The cortex was mottled and granular, with a spermaceti lustre, through which, at some depth, the amber tinted nucleus could be detected. After a course of good diet and stimulants, the left lens was removed by the inferior section upon the 12th of October; a horse hair stitch was inserted. The operation was performed without difficulty or complication.

15th.—The stitch was removed, and the corneal flap was found infiltrated with pus. Notwithstanding support, the condition of the cornea became gradually less promising; there was no pain and but little vascularity. At last the cornea became quite opaque and vision was hopelessly lost. The globe has become atrophied.

XVI.—DOUBLE CATARACT.—Peermah, *Æt.* 68, Mahomedan female, admitted 9th October 1863. Six months ago her left eye was operated on by a native oculist; the depressed lens rose soon after the operation; she saw well for two days, but subsequently vision failed entirely. There is a siliquose cataract in the eye operated on, and the retina is insensible to light. Under atropine, the right pupil dilated freely, exhibiting a cataract with amber colored nucleus shining through a soft and granular periphery. Health good. Is in very poor circumstances.

October 12th.—The right lens was extracted by the upper section; all did well. A horse hair stitch was passed through the lids. Up to the 15th, the eye promised well; on that day some pain set in, and the cornea began to look hazy along the line of incision. There is some soft matter in the anterior chamber, more like pus than disintegrating lenticular matter; pains in the eye-ball, temple and forehead. The setting in of the heavy monsoon rains seems to have been the exciting cause of this unfavorable change.

29th.—The edge of his corneal flap is sloughing, and partial prolapse of the iris has taken place.

*November 3rd.*—The shortened corneal flap and the prolapse are becoming incorporated with each other.

*28th.*—The cornea has been gradually clearing, up to this date; a slight circum-corneal congestion is now setting in, and the dulness of the upper half of the cornea is re-appearing.

*December 4th.*—Inflammatory action has subsided and the cornea is again beginning to clear.

*January 18th.*—The morbid action has ceased, leaving the cornea in an unsatisfactory state. The upper half is dulled with a patchy opacity, and the lower half is not so transparent and healthy-looking as it was. The pupil is closed up and there is no vision.

*22nd.*—An artificial pupil of small size was made opposite to the clearest portion of the cornea; no vision resulted; the operation was repeated a second time.<sup>(1)</sup>

**XVII.—DOUBLE CATARACT.**—Veerasawmy, *Æt.* 40, male, Pariah. Admitted 28th October 1863. Is a healthy man. Both lenses are cataractous, the left lens being the more advanced. Under atropine both pupils dilate fully, revealing incipient opacity in the centre and posterior layers of the right lens. The periphery of the lens is beginning to be hazy. The left lens is white and equally opaque throughout. The cataract appears to be cortical, soft and nonstriated. There are no adhesions.

*November 5th.*—The left cataract was removed by the inferior section. During the operation there existed intense muscular spasm of the orbicularis and, probably also, of the muscles of the eye. Though the last tag of the cornea was most carefully divided, all pressure being removed from the ball, yet at that moment the lens in its capsule was projected from the eye with force, and along with it a considerable quantity of vitreous humour. The eyelids were immediately closed and horse hair stitches inserted; a compress was laid over the closed lids, and secured with adhesive straps and a bandage. No unfavorable symptom followed this untoward complication.

*December 20th.*—He was discharged with a distorted pupil, but with useful and accurate vision.

**XVIII.—DOUBLE CATARACT.**—Seeneevasen, *Æt.* 54, male, Hindoo. Admitted 31st October 1863. His right eye being

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(1) *11th February.*—There is now good hope of a restoration of vision.



cataractous, was operated on for solution on the 19th September 1862; there ensued much pain; the cornea is semi-opaque, and the anterior chamber has almost disappeared; the iris is lying in contact with the cornea; the pupil is fixed and a dense yellow opacity completely obscures the centre of the cornea. The left lens is cataractous; the cataract nuclear and exhibiting a brownish yellow opacity; margins of the lens transparent; has no useful vision.

*November 5th.*—To-day extraction by the inferior section was performed on the left eye. There was no difficulty attending the operation, but, on the last tag of the cornea being divided, the lens, with a small quantity of vitreous humour made its escape, enveloped by its capsule. The lens proved to be symmetrical, but much atrophied, and of a rich garnet lustre, being dark in the centre like a carbuncle. The lids were closed with stitches and a compress of lint, secured with straps and a bandage, was applied. The eye did well, though a little vitreous humour having become impacted in the lips of the incision, delayed, for a time, complete union of the edges.

*December 8th.*—Slight opacity of the edge of the corneal flap, due to partial inflammatory action with exudation, appeared, and retarded the cure.

*17th.*—Ophthalmia has affected both eyes, and some anxiety is felt as to the result of this intercurrent affection upon the enfeebled corneal structure.

The edge of the cornea sloughed a little; on finally healing, it was found that a distinct opaque band had encircled the pupil, leaving a clear central foramen.

*January 18th.*—All morbid action has ceased; vision is good, though not as yet very strong.

**XIX.—DOUBLE CATARACT.**—Kistapen, *Æt.* 54, male, Hindoo. Admitted 15th October 1863. Pupils dilate imperfectly under atropine instillation. Both lenses are cataractous, the left being the more advanced of the two. In the right lens, the reflection of an amber colored nucleus is faintly seen, in consequence of the white faintly striated opacity of the periphery; the left lens being more advanced, its periphery is granular and conceals all nuclear reflection. Weather being unsettled, the operation is postponed.

*November 5th.*—The lens of his left eye was removed by the lower section; there was no difficulty in making the

section ; on the escape of the aqueous humour the pupil contracted, and on making pressure, a small quantity of vitreous escaped with the lens. The lens was large, with a hard amber nucleus, and small amount of softened periphery. The eye was not disturbed till the 10th, when, on examination, the cornea was found a little hazy ; there was also present some conjunctival chemosis, but no pain or discharge.

*18th.*—Ophthalmia affects both eyes, and, in both is attended with slight chemosis.

*30th.*—Up to this time the eye operated on has been doing well ; to-day the cornea is a little hazy.

*December 8th.*—The pupil of the eye is closed, an opaque exudation connected with the corneal section blocking it up. This patient absconded from hospital on the 12th of January, the operation having failed to restore vision, and no opportunity of attempting an artificial pupil having been afforded.

**XX.—DOUBLE CATARACT.**—Ramiah, *Æt.* 60, male, Hindoo. Admitted 31st October 1863. Both lenses are cataractous, the right being the more advanced of the two.

*Present state*—Right lens quite opaque ; superficial layers granular and nonstriated ; the deep reflection of an amber nucleus can be discerned in a good light. Left lens is affected centrally ; periphery clear ; has useful vision with this eye. Suffers from catarrh and looks asthmatic.

*November 5th.*—Today the right lens was extracted ; there was some difficulty in finishing the section, owing to the falling forward of the iris and lens ; with care the section was completed without injury to the subjacent parts, and the lens was removed in the usual way. It proved to be a nuclear-cortical cataract, with an amber nucleus surrounded by soft peripheral matter, which latter required removal by the scoop of the curette.

*December 10th.*—Today the eye was opened ; the horse hair stitch being cut, all was found to be progressing favorably, with the exception of a very small prolapse. A severe attack of asthmatic bronchitis occurred at this time, and the result was considerable increase in the size of the prolapsus.

*26th.*—The prolapsus, which had acquired considerable size, is now subsiding under the application of a fine point

of nitrate of silver. The condition of the eye steadily improved, the cough became allayed, and on the 23rd of December he was discharged with a pupil, slightly excentric and drawn upwards a little, but with excellent vision.

#### REMARKS.

I propose restricting my remarks to points of practical interest. Out of the twenty cases recorded above, the operation of extraction succeeded in fourteen, in all of whom useful vision was restored. Of the remaining six, one, namely, Polliam (case No. 8) was found to have had total insensibility of the retina, a condition, which, had it been detected sooner, the operation would never have been performed. In this case, however, it is interesting to note that the corneal section united without difficulty or delay. In three of the six cases the operation failed; in cases 9 and 15 from constitutional causes alone, in case 19 probably from atmospheric causes dependent on the unsettled state of the weather. Two cases of the twenty still remain under treatment, one of which has a fair prospect of having vision restored by an operation just performed for artificial pupil. Classing these also as failures, we have still left the encouraging proportion of  $\frac{14}{20}$ ths restored to useful vision by the operation of extraction.

The persons upon whom I operated, were of the poorest classes of the native community (I except the European and East Indian cases, Nos. 3, 5, 12); two-thirds of the cases have terminated favorably, notwithstanding the age and want, the emaciation and bodily weakness of the majority of the patients. In all, the arcus senilis was present, but proved no obstacle to successful union of the divided cornea. Most of the cases required rest in hospital with nutritious food and arrack for twelve or fourteen days before the operation; after the operation was performed, good diet and arrack were continued without intermission, as a general rule, and flagging vitality was assisted by doses of bark and ammonia, or, of bark and acid. Experience seems to indicate that neither age, poverty, protracted want, arcus senilis nor emaciation form serious objections to the performance of extraction, provided that distinct anemia, (as indicated by the state of the conjunctiva and by the pale lack-lustre skin,) or depraved blood, the result of syphilitic or mercurial poisoning, be not present. In such cases of anemia and cachexia I should ex-

pect that rapid death of the cornea, with purulent infiltration of its substance, would follow the operation for extraction.

I should say, further, that patients of the lower castes, who are flesh-eaters, would have a better chance upon the whole, of recovering from the injury caused by the operation, than would patients of castes which avoid animal food, though in this matter I have as yet had no experience, beyond remarking the beneficial effects upon the vigour of the system of a generous meat diet, continued for days or weeks before the operation is performed.

If, as regards vital energy and reparative powers, the native patient is unfavourably situated, when compared with the European, still, the fact must not be overlooked that the former has some physical and mental advantages in his constitution and nature, not enjoyed, by the latter. The native, for example, suffers much less pain during the operation, infinitely less after it; if he has less vital reaction, he has also less chance of that reaction passing on to excitement and inflammation. The complications in the case of the native are such as generally require support rather than depression; his eye has, besides, in the end, a better chance of rallying from grave disease than the European eye has, and finally he has a mental constitution so quiet and equable, so free from present or future anxiety and apprehension, that in this point alone he possesses many advantages over his more excitable European brother. As a slight counterpoise to these advantages, he is much more careless of the injured organ, and suffers in exact proportion, the penalty of his philosophic indifference and remarkable lack of common sense.

Of the 20 operations, 15 were by the upper, and 5 by the lower section of the cornea; at present I prefer the upper section.<sup>(1)</sup>

So little pain attends the operation in the case of the native, that chloroform is never administered; I think however that its employment would be advisable, in cases like the 12th on the list, in which spasmodic action of the orbicularis and ocular muscles might be present. Had the patient

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(1) Mr. White Cooper and Mr. Hart prefer the lower section. The latter gentleman gives his reasons for this preference, in an article published in the "*Lancet*" for October 1862.

just referred to, been under the full influence of chloroform, the sudden escape of the lens, along with a considerable quantity of vitreous humour, in all probability, would have been avoided.

In almost all the cases operated on, the cataract possessed an amber colored nucleus with a more or less soft periphery. Pure cortical cataracts do not present themselves in the considerable proportion generally supposed. The majority are cataracts of "mixed consistence," in which, with good light, the deep amber reflection can often be made out on careful inspection.<sup>(1)</sup>

I operate with the patient recumbent, and adopt the method of holding the conjunctiva with a pair of forceps, lately re-introduced to notice by Mr. France.<sup>(2)</sup> In making the upper section my assistant has charge of the forceps, but in performing the lower section, I lay hold of the conjunctiva with the forceps in my left hand, and make the section with my right; an assistant raising with a speculum the upper lid, and keeping it somewhat apart from the globe of the eye. The conjunctiva is seized with a deep grasp close to the cornea, the globe being kept steadily but free from pressure; before dividing the last tag of the cornea the forceps is removed.

I have to thank Dr. Macnamara of Muzufferpore for his valuable suggestion as to the best mode of keeping the lids in apposition after the operation, namely, by passing a thin silver wire ligature through them, and thus securing the effectual closure of the eye.<sup>(3)</sup> I have found the expedient a most useful one. I have hitherto substituted horse-hair for the silver ligature recommended. The ligature is removed on the third or fourth day, when, if the case be advancing favorably, the aqueous humour will be found to have been regenerated, and adhesion of the cut surfaces far

(1) Mr. Martin of Calcutta, (vide *Ophthalmic Hospital reports*, Vol. 1, page 263,) states that 63 per cent. consist of cataracts of a mixed, and 23 per cent. of cataracts of a soft or fluid consistence.

(2) Vide *Ophthalmic Hospital reports*, Vol. 2, page 20; also review of France's Method by A. Poland in the 3rd Vol. of the same report, page 268. Mr. Windson (vide Art. IV. page 219 of the *British and Foreign Med. Chir. Review*, No. 83, for July 1863,) proves that the use of the forceps, as a means of fixing the eye in extraction of cataract, has been known on the continent since 1841.

(3) Vide Dr. M.'s excellent article "On the operation of extraction in cataract," page 484, No. 14 of "*The Indian Annals of Medical Science*," 1861.

enough advanced to retain it in the anterior chamber. Any slight tendency to prolapsus would, at such a time, be readily controlled, I should think, by the application of the new and valuable myotic, the Calabar Bean.

Sudden changes in the weather, as from heat to rain, or, from warm weather to cold, act injuriously upon the vital powers of the native, depressing them and often converting a favorable case into a most unpromising one. The cold and rainy seasons appear less favorable to recovery from the operation of extraction, than the hot.

In several of the cases, the exciting cause doubtless being the operation itself, ophthalmia occurred several days after the operation, and affected sometimes the eye operated on only, at other times both eyes equally. I felt some anxiety as to the result, but, in most cases the attack subsided, without inflicting permanent injury upon the divided cornea.

Should inaction in the margins of the section be manifest, or, should the edges become faintly opaque, or, were a minute ulcer to appear upon the edge of the flap, I should regard these as hints to improve the diet, to increase the stimulants, and to give bark with ammonia in frequently repeated doses.

The difficulties dependent on the deepset eye of the native, on the small diameter of his cornea, and on the contracted dimensions of the palpebral aperture, constitute, in my opinion, no valid ground for the rejection of the operation of extraction. With the help of the forceps, the globe can be kept perfectly steady, and the remaining difficulty can be readily overcome by any one possessed of a steady hand and of ordinary manual dexterity.

In making the section I have found it well to pass the knife steadily and quickly, but not with undue haste, through the anterior chamber; when counter puncturation is once effected, and the blade has been passed well through the anterior chamber, there is less risk of the premature escape of the aqueous humour and of the folding of the iris over the edge of the knife. The section should then be completed slowly and carefully, the knife being propelled steadily, until all the cornea, up to the remaining tag, has been divided; before dividing the few remaining fibres, the operator should see that all pressure is removed from the eye, and that no signs of spasmodic action of the orbi-

cular and ocular muscles are present, and then accomplish his object by *withdrawing* the knife gently and so dividing the remaining portion of the cornea; in some cases I have endeavoured still further to secure the gentle division of the remaining minute portion of the cornea, by lightly pressing it against the edge of the knife with the nail of my forefinger, as I have frequently seen done by my friend Mr. Walker of Edinburgh. All jerk is thus avoided; it is well, however, to remember that the edge of the knife is apt to be slightly blunted by the expedient, unless great care be taken in applying pressure with the nail.

ART. III.—*Memorandum on some of the more common and unsuspected sources of contagion and infection.* By J. J. WOOD, Assistant Apothecary, Madras Army.

It is proposed, in the following pages, not to attempt to unravel any of the mysteries of disease or of pestilence, nor to explain away any of their hidden causes; but simply to point out to the student, and also (if I may be allowed to add) to the many advocates of Sanitation, some few of the more evident and constantly operative agents of mischief, which meet us at every turn.

Dr. Bidie, in his able essay on the Etiology of Cholera, very properly remarks, "I have no doubt that cholera is often carried into barracks, sepoy lines, camps, &c., through the agency of the lower animals, such as dogs and pigs. There cannot be a doubt that they are capable of being affected by the choleraic poison, and, reflecting on the careless manner in which ordure is strewed about in native villages, and how indiscriminately these brutes feed on every thing that comes in their way, it is impossible that they can all escape being affected by the disease. I think, therefore, that we may fairly assume that these animals are frequently the means of carrying cholera from the crowded filthy native hut, where it thrives in a congenial atmosphere into the model street, lines or barracks. It will at all events be a prudent measure, during the prevalence of cholera, to banish all vagrant animals from town, lines, camp, and barracks."

It is presumed that there are but few Medical men in India who would dissent in the least from the above opinion.

But there are other media of contagion, (even in a large city like Madras, with its Police and Municipal Establishments) some of which appear to me to be almost, if not altogether, overlooked.

I.—It is an undeniable fact, that the *palanquins* so common here, are not only used by persons going to their places of business, but are constantly employed to convey individuals attacked with cholera, small-pox, and other diseases to the hospitals and dispensaries; and, finally, to carry away the dead from the latter places to the houses of the friends of the deceased, or from the house of one relative to that of another. Indeed, it is far from imaginary, during the prevalence of cholera, for palanquins to cross one another in the morning, one conveying a cholera patient to the doctor, while the other contains the body of a man who had died in hospital during the night of the same disease. Well, early during the day, one of these is perhaps hired by some poor clerk, who does not feel disposed to walk to his office; while, in the afternoon, some old lady, decked out in her best, may probably be seen leaving Black Town in the other, on a visit of ceremony to Vepery. How often have we seen officers in Civil Military employ ordering palanquins, when, from some reason or other, their own conveyances were not at hand; certainly not so frequently now as formerly, but it was not long ago that a Medical Officer was prevented, by a very slight hint, from going into one of them. He chose, after that, to walk for some little distance in the sun with merely the protection of an umbrella, rather than run a risk of getting cholera so frequently prevalent in Madras.

Palanquins (as well as dhoolies) are, without doubt, not only the most comfortable, but often the only safe, means of conveyance for the sick, the convalescent or the infirm; while they are, at the same time, the most convenient vehicles for transporting the dead; for these, as well as for pecuniary reasons, parties will always be found, unwittingly, patronizing this mode of conveyance. On the occasion of Sir William Denison leaving our Presidency for Calcutta, a General Officer, who had sustained some very severe injuries, was conveyed in one of these palanquins from the Beach to the residence of the nearest Surgeon.

Other instances could be adduced, but these are enough to shew that the most respectable persons may sometimes be



placed in such circumstances as to have no alternative but employ one of these conveyances.

II.—The “Shigram,” “Jutkah,” or *two-wheeled pony-coach*, which may be seen in the streets of Madras in such numbers, is employed for *some* of the same purposes as the palanquin by the poorer classes, especially natives, it being a cheaper conveyance.

It does not require a very close inspection to discover how much fouler these vehicles are than even the palanquin; a single peep into some few of them will generally suffice to prove that they are very far from being either clean or safe; for on the so called lining and foot-board of the coach will often be found stains of blood and other fluids, as well as traces of vomited matters, &c., besides all this, they appear to afford comfortable quarters for numbers of vermin of various kinds.

Indeed, this is not to be wondered at, for not only are they employed by the peons for conveying the drunken, the wounded, the sick and the dying to hospitals, but they are often found literally crammed with “*mild Hindoos*” from Black Town, the most remarkable feature among the majority of whom is, that they are seldom without the itch!

And in the face of all this, a poor soldier, perhaps on furlough at Madras, will occasionally be seen in one of them, going from one place to another, with his wife, and, possibly, a couple of children.

Few men of any pretensions to respectability, European or Eurasian, would be seen in one of these, as it appears to be connected with the idea of poverty or loss of position; though in case of sickness or other emergency, when no other conveyance is to be had, they are thankfully taken advantage of.

There may be many modes of remedying such a state of things, or there may be none, I leave the matter therefore in the hands of the proper authorities. But it is worthy of trial whether this risk to the public could not be avoided by organizing a system of sick carts or doolies attached to each Madras Hospital, and which could be hired out,—and by interdicting the conveyance of those ill of infectious diseases in vehicles intended and hired for general traffic.

III.—The subject that I am now about to draw attention to, will, I suspect, startle some who have not heretofore

bestowed a thought in this direction ; I allude simply to the *handling of coin*.\*

Now, coin, according to any one's observation, is usually clean but once, *i. e.*, on its issue from the Mint, but from the moment it begins to circulate, it must necessarily become soiled in a variety of ways, in passing through the hands of a large community, the individuals composing which being always made up, not only of the rich and poor, but of the diseased as well as the healthy : and this must be the case in every country.

Contrast the newly issued coin with that in circulation for a time, and some of the latter will be found nearly black, not merely from chemical changes on the surface of the metal, but from actual filth, consisting of *sundry organic matters* (and what may not these be?) mixed up with earthly particles in the shape of dust, forming a compact paste, continuing to increase by simple accretion, or to diminish by friction, according to circumstances.

Now, many persons, chiefly non-professionals, have an aversion to touching any article, be it of clothing, bedding, or of any thing else, that has been handled or made use of by individuals suffering from such diseases as syphilis, gonorrhoea, small-pox, ophthalmia, and several other affections, and they are not to be blamed for it: the mere thought of having to shake hands with any one afflicted with leprosy is, I know, enough to make many shudder. Are there not many who would hesitate to receive a note or a book from a peon laboring under the itch? Who would permit a servant, either in a house or in a public office, to continue at his work after it was once discovered that he needed soap and sulphur? Yet money is passing through the hands of thousands of men, women and children afflicted with the above mentioned diseases, and others equally contagious.

Every Medical man must have observed that it is not merely through the hands of those who daily mingle with the outside world that money circulates, but that it often travels to and from parties more or less bed-ridden from contagious or infectious diseases.

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\* Some of our readers have doubtless heard of a Madras Collector who insisted on all Rupees tendered to him being washed before he handled them. The same rule of submersion in water, of all coin, is observed in the Quarantine harbour of Gibraltar. — *En. M. Q. J.*

A case or two in point may not be out of place.

An only son, and very often, therefore, a spoiled child, is suffering from an attack of small-pox or measles: he is now and again, no doubt, ordered something nauseous as medicine; and, as a matter of course, the boy will not take it. Promises of all sorts are held out by the doting parents—of taking him to the Museum, the Review or the Theatre, of bringing him tops, kites and marbles, but all to no purpose. At last, another expedient is thought of, which usually proves successful; a new rupee is produced, which tempts him, at least, to try the potion. From that out, the child never swallows anything (except what he chooses to call for) without some fraction of money being given him at each time. The money thus collected is never parted with, though daily counted, until he is pronounced well. He is then permitted to put it in *circulation*, by giving it in exchange for fruit, confectionery, and toys.

Another young hopeful with an attack of ophthalmia, never can be brought (at least in some families) to understand having "Caustic solution" dropped into his eye, without suitable present of money being given him on each occasion.

Yonder is a group of natives gambling, one of them, with a suspicious looking eruption, is seated, cozily scraping himself with the edge of a piece of coin; while a second is diligently searching for another piece, which has, a moment before, rolled into the sewer. These are not fictions. Other instances must occur to the mind of every observer.

And for all this, it is very remarkable that we have never heard "even a whisper" as to the possibility of pieces of coin being contaminated, soiled, or, in any way rendered foul, by their having been in the possession of individuals suffering from contagious diseases. This is not correct as regards England, where the better classes of the community seldom touch naked copper coin, from the very fear of being infected with scabies. Tradesmen always wrap the copper change in paper before handing it to a customer. So that not only are the hands not washed after the counting of hundreds and even thousands of pieces of both silver and copper;\* but children, who are constantly in the habit of keeping, or playing with, coins in their mouths, are seldom

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\* The hands after counting sums of money, are always more or less soiled.

prevented from doing so. Many professional men will recollect to have been consulted by parents, on account of children having accidentally *swallowed* small copper or silver coins.

We never hear of unfortunate subjects of that loathsome disease, the lepra of this country, being employed as cooks, "dressing-boys" or washer-men,—in a word, they are never employed, so that there must be at least a suspicion, if not a belief, that that disease is contagious: yet they are allowed to trade as bazaarmen, hawkers, &c., or to wander about the streets as mendicants. Now, there are few non-professional persons, European or Eurasian, who will go near one of these so afflicted, much less touch them; though the charitably disposed will often fling a few pieces of copper to them. These pieces of coin, though lost sight of by the giver, soon find their way into the hands of the bazaarman; from his into those of the "shroff" or money-changer; next, into the keeping of, possibly, a butler, who has exchanged some silver with him for the market; and, finally, into the possession of his European employer.

Some of our readers will doubtless remark that the disease under consideration is certainly not contagious. I, for my part, have sundry doubts about its being so, and this, I believe, is the opinion of most Medical men; but there are others, and these are, I think, rather the more numerous body who are persuaded otherwise.

Whatever may be the belief of this or of that party as to its contagiousness, we know from observation the one usually acted on, for not only are servants in Government employ often discharged immediately that they are discovered with the disease; but boys, no matter how talented, are seldom or never suffered to remain in any of the public schools after once the slightest symptoms have been observed on them.

Money, I may be allowed to repeat, appears to be the only article that has never, to my knowledge, been suspected of transmitting contagion or of disseminating disease.

If it be well established that the materials of clothing and bedding; the walls and flooring of hospitals, jails, &c.; the vessels, sponges and instruments used by the Surgeon, and even his own hand, (washed though it be) are, under certain circumstances, the vehicles of disease, then there

can be no reason, as far as I can see, why coin\* should not be as capable of playing a similar part, only more constantly, and on a more extensive scale.

Money, by way of comparison, may well be called the blood-globules of civilized communities, circulating almost every where, from the palace to the hovel and back again. And whilst its possession commands comforts for the poor man, and surrounds the rich with luxuries, it does not require any great exercise of the imagination to conceive how it may, circumstances favouring, become—in the sense we are considering it—a messenger of evil to either.

It will very likely be said, that though all this is possible enough, yet that disease or contagion *has never been traced* to such a source as coin; but it will, I think at the same time, be admitted that it is difficult to account for the occurrence of certain cases in any other way.

Permit me to lay before my readers a simple but not unlikely case, one which some of our Army Medical Officers will, doubtless, recollect something similar to.

The Surgeon of a Regiment is alarmed, probably, some fine morning, by a sturdy orderly bellowing out that “Khurnel Sahib” (the Colonel) wants him, “Soon—immediately.” Not a moment is to be lost, for there must, he thinks, be something serious the matter; and accordingly the Doctor is in the house in a trice, breathless. “What’s the matter, Colonel?” After the usual civilities, followed by a deal of circumlocution about the future patient, the lady of the house makes her appearance, and exhibits her hands to the Doctor with a very inquiring look, who, (as his practised eye recognizes something suspicious at once,) tells her jocosely that she has simply an attack of the “Malabar.”

“And what is that, Doctor?”

“Merely the itch, Madam.”

“Dear me; is it dangerous, Doctor?” “How could I have got it?”

“Why, eh, I suppose from the ayah or some other of the servants.”

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\* Particularly when coated with filth, which affords—as can be easily understood—a nidus or soil for virus of any kind, especially when fluid.

The bell is rung immediately and all the dependents are summoned and duly examined by the Surgeon, and woe be to the unhappy wight who happens—who dares—to have the itch then ! But no ; fortunately for themselves they all “pass muster.”

And now follows one of those interesting dialogues which occasionally take place between physician and patient.

The lady, not quite understanding how she could have become the subject of “such a filthy, shocking complaint” as the itch, puts the Doctor a number of knotty questions, in quick succession, about contagion in general, and her own case in particular, which are not always easily, or at least, satisfactorily answered.

The Doctor, finding that his examination at the Royal College of Surgeons was nothing compared to this, and having no desire, at that hour of the day, to be “plucked,” now begins and delivers a discourse, (the subject of which it would be difficult to tell) seasoning it liberally with as many of longest and strangest sounding words as he can command, with the view—we charitably suppose it—of satisfying his lady patient by puzzling her altogether.

He now takes leave, after promising some medicine to put all right.

The lady, not much edified by the prelection, and determined to sift the matter further, again brings the servants together, making strict enquiries, and only feels “so sorry” that she has not found some culprit, whom she could have the gratification of discharging at once.

This is a case, in which it is more than possible that coin, contaminated by its previous pressessor, was to blame. Others may differ here in opinion, but it is my firm belief, that coin is as capable of transmitting the *materies morbi* of most of the contagious and infectious diseases—in England, scarlatina included—as any other material.

Surely, no question will be asked as to what we are to do under such circumstances? There can be no alternative. Constituted as communities always have been, and always will be, the “root of all evil” must of necessity pass through the hands of the poorest artizan and ryot as well as of the rulers of the country,—through those of parties whom society shuns, as a rule, into the possession of the first lady in the land.

It may, I think, be safely left to the ingenuity of heads of families to make their own arrangements with servants and others, in order to avoid risk or, at least, ensure cleanliness.

Many, I have no doubt, will feel inclined to ridicule such possibilities as those we have been considering; but it will, I think, be conceded, even by these, that it would be prudent, at all times, never to present *children* with any coin that had not first been thoroughly cleansed.

The only ablution that money undergoes during its course of circulation in this part of the country, as a rule, appears to be at the hands of the "khassace" or butcher: this is very remarkable. The moment that this tradesman receives any money, he drops it into a pot of water, which always stands by him: the only reason for such a proceeding, as far as I have yet learned, is simply, the oft-repeated one in India, namely, "*Custom*."

IV.—It cannot be so difficult a matter to prevent dogs and other quadrupeds from entering a cantonment, carrying into such the seeds of disease, as to keep away another pest of all Indian towns, namely, the veritable *crow*.

This impudent and knowing intruder, after feeding on offal of every description, (for nothing comes amiss to him) dips his beak without the slightest ceremony into any vessel containing fluid that may happen to lie within his reach, be it goglet, wash-hand basin or tea cup. It has frequently struck me that cholera is as often introduced into a household in this way as in any other, provided we are to believe that disease is communicable.

What then is the remedy? Are we to exterminate the crow and his able colleague the "raven?" Certainly not, for that would only resemble the "flying from the ills we have to others that we know not of." We must recollect that they are among the most able and most willing of Nature's Scavengers here—that they are to us, in Madras, what the jackal, vulture and adjutant are to Calcutta. But the inmates of each house could, by some trifling arrangement, easily prevent the contamination by these creatures, of articles of food and drink, at least in the generality of instances.

V.—There is, further, another source of annoyance, and, it can hardly be doubted, of disease also, which appears at

first sight, to be one not easily mitigated ;—I refer to the *common house fly*.

Wherever organic matters are present,—of whatever nature, whether in a state of decomposition or not,—there will this creature, surely enough, be found ; and at certain seasons of the year, in millions, blackening every thing with their numbers ; reminding us very forcibly indeed, of ancient Egypt and its plagues. It is of no use alluring them with sugar to a particular part of our dwellings, and then blowing them up with gunpowder, as I have seen done ; or poisoning them with sweetened infusion of Quassia, as has been recommended ; or of exhibiting the compound of cream, sugar and pepper, that we read of in antiquated receipt books : so long as we have dirty streets,\* or permit filth to accumulate in our neighbourhood, we must permit also the incursions of these uninvited messmates.

These creatures are, perhaps, at one moment, depositing their ova, or feeding on some animal substance undergoing putrefaction, and, at another, if unmolested, sipping tea with us at the breakfast table ; a fact which but few apparently seem to be cognizant of. Those in attendance on the sick must have observed that they collect as numerous about the excretions of the cholera or other patient as about the most savoury food.

Are they not sometimes a nuisance to the sick, rendering “maggotty” the bedding and persons of small-pox patients ; the dressings about recent surgical injuries ; as well as certain forms of ulcer, &c. ?

When a student, I had the curiosity to collect a number of maggots discharged from the nostrils of a patient who had syphilitic disease of the nose, and, having put them

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\* It is nothing uncommon to see a large patch here and there in some of our streets, those of New Town in particular, covered with swarms of flies. I examined several of these spots and found that they consisted altogether of rich manure, the decomposing remains of kitchen and household rejectamenta, evidently brought from some old dunghill, which had very likely been ordered by authority to be removed out of the Town. On enquiry I learned from some of the old residents that this was the usual material with which the roads of New Town were repaired ! In addition, I myself have seen the refuse from houses, as well as the black offensive earth from the drains, allowed to dry on the sides of the roads, and then applied to filling up hollows in the streets to make all level. Comment here would be superfluous, but that these are actually things of constant occurrence in the locality in question, the authorities can easily satisfy themselves at any time.



carefully by in pill-box, found, after they had passed through the other stages of their metamorphosis, namely, those of the pupa and imago, that they were ordinary house-flies. The mystery about the flies depositing their ova in such a strange situation as the nostrils of a *living* man, was very soon solved. In addition to the fact that the discharge from the nares was extremely *fetid*, I learned that the patient had been lying *drunk* in the guard-room a day or two previous.

Is it not quite possible that some diseases, erysipelas and sloughing phagædena included, believed by Surgeons to be communicated, not only by contagion from sponges, vessels, &c., but by *infection also*, are often propagated by these creatures?\* If birds and insects are considered capable of carrying the pollen (a powder!) from the flowers of a male plant, for miles, and then unconsciously fertilizing the flowers of the female, we should not, I think, hesitate to entertain at least, a suspicion, that flies may often be the instruments of conveying *fluid* virus of various kinds, (adhering to their proboscides, feet, and so on) from one patient to another in the *same ward*.

Whether they may not sometimes, in the same way, bring the poison of cholera to our tables, I shall leave the reader to decide.†

And will the student of Hygiene now ask, (with all his knowledge of nature from books and observations) whether this nuisance—this evil—can be mitigated or not?

Every one who is in any degree conversant with these matters, will bear me out when I say, that it is almost entirely in our own hands, as to whether we shall have a large or a small number of flies in any given year.

It is well known to naturalists that the female flies deposit their ova on some animal substance,‡ dead and beginning

\* "A French Officer, in garrison at Evreux, has died from a fly-bite on the lip. The insect, it is supposed, had been feeding on putrid meat in the Jardin des Plantes, in Paris, where the accident occurred."—*Illustrated London News*, June 27th 1863.

† It is a common observation that flies are generally very abundant during the prevalence of cholera, whatever may be the inference we are to draw from such a co-incidence.

‡ Dung or manure is sufficient.

to putrefy, (by a mistake from unaided instinct) even on plants having a fœtor resembling that of carrion.

The office of the larvæ of these (as of some similar creatures in the economy of nature,) appears to be that of consuming all dead and exposed animal matters *rapidly*, in order to prevent the atmosphere being contaminated to any great extent, by the gaseous products of decomposition.

An animal has scarcely ceased to breathe in some parts of this country when numbers of these flies, among them other and larger species of the genus *musca* also, begin their work at once, particularly at the nares, mouth and other apertures of the body. The process of incubation is, in some cases, completed within the body of the parent fly, so that the larva are born active, and the noisome banquet is commenced while the carcase is still warm.

It is, I think, therefore, reasonable to conclude, that if we were to cut off the supply of pabulum required for the nourishment of the larva of these flies, that their numbers must necessarily diminish:—in other words, if we were to have carried out and buried at a distance *daily*, all the organic refuse from towns and cantonments, it is evident that the larva, if any were to be found, would scarcely live to pass into the pupar stage.

However parties may differ in opinion as to the efficiency of the Scavenging Establishment of Madras, it would indeed be a sorry experiment to put a stop to their work *completely*, even for a short time.

It would certainly not be long after, that we would find (apart from every other consequence) some few of the more ancient and well-known scavengers of creation, with whom work and wages are one and the same thing, finding their way here by sight and smell: yes, not only would numbers of huge, strange-looking birds (vultures) hover over our heads in company with the kite; but the jackal, having become a permanent resident, would be nightly, as he is elsewhere, a fellow-passenger with us in the streets. Yet all this and more would be tolerable—nay, harmless, in comparison to the incessant annoyance, and increasing risk of disease being perpetuated, from myriads of flies; and this would continue to multiply, of course, in proportion to the work required of them.

The number of flies in any given locality is a pretty sure index of the extent to which nature is supplementing the work that could or should have been performed by art; and the greater the number, the surer the indication that that particular locality will become, ere long—if it is not so already—any thing but a sanatorium.

It is not sufficient that our cemeteries and slaughter-houses are far from the town; nor is it enough that carts and men are *employed* to remove every thing to a distance from our habitations, capable of becoming hurtful; but a number of energetic men should be “told off” to small localities, and directed to inspect the same frequently and regularly, reporting on them at stated periods, either personally or on paper.

If the Establishment, as it now stands, cannot muster sufficient hands for the better supervision of the work, from deficiency of funds, which I rather suspect to be the case, why should not the authorities look to the community for help, which I think would be gladly and freely given?

Why could not Madras be mapped out into sundry *small* districts, and placed under the surveillance of a few of the more respectable, permanent residents of each petty division of the Presidency? These, in their turn, could be helped by one or two residents in each street.

Not a few, I imagine, would volunteer in a cause like this, if it was but fully and fairly represented to them.

And finally, some vigilant officials should see that the filth was not merely removed from one locality only to render another more filthy; but carried out into the country, and buried deeply in plantations, topes, fields, or what are termed, wastelying lands; the most natural, (physiologically speaking,) and the most useful places for the interment of dead organic matters.

We would then, it is presumed, have less of house refuse and black foetid soil from the drains on the sides of the roads,—no more putrid manure brought to *repair* the streets up to our very doors; and the detachments of flies less numerous in the chamber of the sick, or at the family dinner of the poor man.

It now remains for the student of Sanitation to examine

carefully and see whether these things are so or not,—whether there be any germs of truth in these imperfect sketches. It will, I fancy, divert him for a time from his ever-beginning and never-ending themes of Drainage and Ventilation; and lead him to suspect that there are, besides these, many more agents at work in the propagation of disease “than are dreamt of in our philosophy.”

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ART. IV.—*Report on the Cholera Epidemic as it appeared in the Cuddalore Jail in December 1863.* By W. DOYLE, M.D., F.R.C.S.I., Acting Civil Surgeon, Cuddalore.

(Communicated by the Principal Inspector General Medical Department.)

THE recent outbreak of Cholera in the Cuddalore Jail can hardly be said to have taken place without some warning, as six cases occurred in August and September last, and when the disease reappeared in December, there was an interval of five days between the first two cases and the violent outburst of the epidemic. The first two cases showed themselves on the morning of December 5th, and from that to 25th forty-six persons were attacked, twenty of whom died. As those who were taken ill on 5th began to recover, and no fresh cases appeared, I was induced to hope that the disease would pass by without any fatal result, as was the case in August and September last; but on 10th all such hopes vanished, as, on that day, five cases occurred, and four of them terminated fatally. From this to 25th, with the exception of two days on which no case occurred, the admissions varied from one to six daily. The greater number of those who were attacked suffered severely from cramps; vomiting was common in the early stage, and exhaustion very soon supervened, so that the majority were collapsed and pulseless on admission into hospital. This applies more particularly to those who were taken ill at night, as concealment was more difficult in the day time, but no matter when the attack came on, after two or three stools the patient became collapsed. The people appeared to be afraid to come to hospital, and as many were taken ill towards morning, between two and four, they did not apply for assistance until they were absolutely obliged. Seventeen persons passed pink stools, and ten of them died. One man passed

inky motions and recovered. The evacuations were received in chatties containing lime, and buried at some distance from the jail. But in spite of all care, they were frequently ejected about the ward in such cases, and was immediately thrown upon the place to absorb the offensive matter, which was carried away immediately, and hot ashes were spread upon the spot. The hospital, however, soon became very foul, but as it is large, I was able to shift the sick from ward to ward, whilst the dirty room was being washed and ventilated. This had to be done repeatedly, and the hospital was given up entirely to the cholera patients, the ordinary cases of sickness being removed elsewhere. Out of a large number of orderlies who were employed in attendance on the sick but four were attacked and two died. It is worthy of remark that none of the cooks suffered, although for some time they were crowded together in one of the worst ventilated cells in the jail. Dry grain diet does not seem to be so favourable during a cholera epidemic as one of rice, as in the present instance those who were fed on dry grain suffered most. Out of 156 on dry grain, 22 cases occurred and 18 deaths, whilst out of 286 who received rations of rice, 24 were attacked and but 7 died. This, however, may be only an accident, as in the early part of the epidemic, with the view of changing the diet, if advisable, I made inquiries in this respect, and I found up to that time the balance was a trifle in favor of those who were living on dry grain. It is possible that the greater mortality amongst those on dry grain may only tend to show that cholera is more fatal amongst the poor and miserable. "The respectable prisoners," *i.e.*, the richest, getting rice, and the poorest, those who were half starved all their lives most probably, getting dry grain. Under those circumstances the rations, whether of rice or dry grain, may not have had any thing to do with the mortality, and the greater percentage of deaths amongst those on dry grain may be due to such prisoners being the poorest consequently, the weakest and least able to resist the attack of disease. The poorest people also are the wildest, perhaps the most liberty loving, and least accustomed to restraint of any kind, amongst them are a number of Currawahs or jungle people who bear imprisonment very badly, and therefore confinement may be a greater predisposing cause of disease to persons of this class, than to those who are somewhat above them in the social scale. The treatment was nearly the same in all the cases. When a patient was

brought to hospital he got two Paterson's pills, followed by a stimulating draught, or brandy and water, generally the latter; he was at once covered up, and heaters and friction were freely used. In from 15 to 20 minutes 3ss. to 3i. of Condyl's fluid was given in rain water, and repeated every half hour or twenty minutes. Brandy was given occasionally and as much broth in small quantities as the patient felt inclined for, or could be induced to take. Effervescing draughts were given repeatedly, and a bottle of imperial water was left beside the sick person to be used as a drink. From the 5th December 48 cases of cholera have occurred, and 43 of them were treated in this way. Of the 43 so treated, 15 died and 28 recovered. The other five rejected all treatment in the way of medicine, clenching their teeth and refusing to swallow when it was offered to them, so that, after making every effort both in the way of persuasion and gentle force, it seemed in vain, as it was unseemly to enter into a physical contest with poor wretches whose life was fast ebbing, and the attempt to give medicine had to be reluctantly abandoned. These five died. If to the above 43 cases treated with Condyl's fluid is added three cases similarly treated in September last, there is a total of 46 so treated with only 15 deaths, or not quite one death in three. As these were all well developed cases of collapsed cholera, the result appears to me to be so far very much in favor of Dr. Evezard's plan of treatment. The following measures were suggested by me with the view of checking the progress of the disease. On December 5th I advised a ration of 3vi. or  $\frac{3}{4}$  oz. of pure white salt to be issued daily to each prisoner in lieu of black salt. On 11th December I repeated this suggestion, and recommended a party of 45 to be sent to a building in New Town, and that if there was any other place available, a party should be sent to occupy it. I also stated that it would be advisable to be prepared to encamp the prisoners if necessary. On 13th December I advised that each prisoner should receive an extra ration of meat, oz. 5, every second day, and oz. 4 of dholl daily. Great care was also taken in the preparation of the food, and the water was taken from a different source at some distance from the jail. Besides this, all hard work was stopped, and the prisoners got a warm meal before going to work in the morning. These suggestions were all complied with, but owing to the difficulty in getting tents, which had to be sent from Madras, and in preparing a cooking shed, the prisoners were not encamped

before 4th January 1864, or 10 days after the almost complete disappearance of the disease, as but two cases occurred since 25th December. To avoid overcrowding the tents, but 267 were sent into camp, and the women, debtors, and about 48 others were kept in the jail. By Mr. Rhode's orders a party of about 88 started for Ootacamund, but it was recalled as there was cholera on the road. The camp is situated at Mount Capper, on a rising ground, in a healthy locality, about two miles from Old Town. Owing to the increased dietary and fresh air, the health of the prisoners has greatly improved, and as soon as the party can be sent to Ootacamund, I am of opinion that the camp may be broken up and the prisoners can return to the jail. In their absence the jail has been cleaned and whitewashed.

It is not easy to say absolutely what was the cause of the disease, but I fear that it may be in a great degree ascribed to overcrowding, deficient ventilation, and in part perhaps to insufficient food. When the disease appeared in August and September, there was no cholera in the neighbourhood, but in December cholera prevailed to some extent in the District, and some cases occurred in the immediate vicinity of the prison.

The jail is not very well situated, being placed on the margin of a back water, which is occasionally very offensive, and the lower cells are almost all badly ventilated, so much so that in only two of them does the space of 500 cubic feet seem sufficient for the inmates. Under these circumstances, when the wards required for European prisoners, debtors and female convicts are deducted from the general accommodation, the jail, considering its means of ventilation, ought to hold, at the outside, but 344 convicted and under trial prisoners. Even this is rather too large a number, as one or two cells must, as a general rule, be given up for store rooms, and in this 344 is included 42, the number which the hospital is supposed to be able to accommodate at 500 cubic feet each. Instead of 344, exclusive of women and debtors, the average strength of under trial and convicted prisoners for the month of September, October, November and December was 442. On more than one occasion, since August last, I have advised that the numbers should be reduced, and I have omitted no opportunity of stating my opinion that the jail was overcrowded. On 17th September I wrote that "I consider the advent of cholera in the present instance as

a distinct warning that the number of prisoners ought to be at once reduced, lest the disease should assume an epidemic and fatal character."

As I found that the mortality was increasing, I wrote the subjoined letter, dated 5th December, to recommend an increased diet, and in consequence of the cholera I wrote again on 13th to urge that the increase should be given at once.

TO THE SESSIONS JUDGE, CUDDALORE.

SIR,—I have the honor to bring to your notice the increased rate of mortality which, at present, exists in the jail from atrophy and diarrhoea. These diseases were always too common, but they have increased very much within the last two months, and since September 28th there have been 9 deaths from these causes alone. As the number of prisoners has been greatly augmented since July last, some of these deaths are, I fear, due, in a great measure, to overcrowding, and partly perhaps to insufficient food; but as no change has been made in the dietary, it would appear to me that the increased mortality may be ascribed to overcrowding. Unless an epidemic should break out, overcrowding would not be likely to tell on the health of the prisoners immediately, and, accordingly, with the exception of one death from atrophy on 21st August, the mortality did not commence until 28th September, since that the deaths from atrophy and diarrhoea have averaged almost one a week, and, including those on convalescent list, there are at present 12 suffering from these diseases.

Having already recommended that the strength should be reduced, it seems unnecessary to say more upon this head. The next step which I would advise is an increase in the dietary.

Dr. Cornish's able report has fully pointed out the insufficiency of the dietary in our jails, and I shall therefore merely refer to it, and suggest that the dietary, as in page 44 of his report, should be adopted for the jail, or if that is too expensive, I would advise that the prisoners should receive an allowance of 5 oz. of meat three times a week, that a ration of 4 oz. dholl should be issued daily, and that all the prisoners now on rice, except the sick, should have dry grain for the morning meal. As it is necessary to vary the food as much possible, I would suggest that a dietary should be given as follows. Sunday—Rice and meat; Monday, Wednesday, Friday and Saturday—Raggy; Tuesday—Cumboo and meat; Thursday—Cholum and meat, and along with this 3 vi. of such vegetables as may be in season. Condiments, &c., as at present.

As the prisoners at present on rice, more than half the strength or 283, might be brought on this dietary by degrees, the increased



expense would not be very great. That some change is necessary, even independent of the present rate of mortality, the accompanying return which shows the number of deaths from atrophy and diarrhoea for the last seven years, fully proves.

*Return showing the number of Deaths in the Jail, for the last 7 years, from Atrophy and Diarrhoea.*

| Years.  | Atrophy and Diarrhoea. | All other diseases. |
|---------|------------------------|---------------------|
| 1856-57 | 1                      | 12                  |
| 1857-58 | 7                      | 10                  |
| 1858-59 | 16                     | 22                  |
| 1859-60 | 14                     | 11                  |
| 1860-61 | 16                     | 14                  |
| 1861-62 | 12                     | 25                  |
| 1862-63 | 12                     | 3                   |
| Total.  | 78                     | 97                  |

Although dated 5th December, this letter had no reference to the breaking out of the cholera, as it was written a day or two before, and it was awaiting signature on morning of 5th, the day on which cholera appeared.

I feel that I ought not to close this report without bringing to notice the humanity and zeal displayed by 2nd Dresser A. Anthony, No. 372, who was unceasing in his exertions, and during the prevalence of the epidemic, he remained in the hospital both day and night.

**ART. V.**—*A record of the Medical Officers who served under the late Hon'ble Court of Directors, and subsequently under the British Government, in the Presidency of Fort St. George—from 1759 to 1863, inclusive.* Compiled from authentic sources, by H. B. MONTGOMERY, M. D., sometime Officiating Secretary, Madras Medical Fund.

THE following tabular statements have been prepared with a view to forming a basis for a more detailed history of the Madras Medical Service; and they may not be altogether

without interest at the present time, when, perhaps before this volume is completed, the Service itself may have disappeared as a distinct body.

Of the many names here given but few now remain, and even among the more recent appointments, death has not been idle.

Any one curious in statistics has here a means of ascertaining what fractional figure would represent each individual's chance of succeeding to the rank of Surgeon—and, if he belongs to the lower grade, he will perhaps look back with envy upon *William Raine* who, in nine months, gained his promotion, and who was subsequently moved into the Medical Board on the day he became a Superintending Surgeon.

But, as it is my intention to offer at a future time a summary of the results herein shown, I will, for the present, defer offering any remarks upon individual instances of good, or adverse, fortune.

The system of arrangement adopted is that of considering the date of arrival as the point from which to start, and then to note the date of attainment of each different grade. This was the only available method as, in the records of the Medical Fund, from which these returns have been chiefly compiled, time of arrival in India, and not date of commission, is that which gives rank and advantages. Some members of the Service now alive will observe that their chance of an annuity from the Fund, is very seriously affected by this regulation.

I may premise that by the courtesy of the Trustees, and of their esteemed Secretary, Mr. Cornish, I have had access to the records of their office, and I have been much assisted in my examination of them by G. Vencatakistnamah Chetty, the Manager.

The intended "History of the Madras Medical Service," will, I hope, appear in a future No. of this Periodical.

| No. | Date of arrival. | Names.                  | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|-------------------------|------------------------------------|----------------------|-------------------------------------|
| 5   | ...              | Dr. James Anderson      | Unknown.                           | Unknown.             | ...                                 |
|     | ...              | Colly Lyons Lucas....   | do                                 | do                   | ...                                 |
|     | ...              | Thomas Davis            | do                                 | do                   | 14 April 178                        |
|     | ...              | William Raine           | Mar. 1764                          | 1 Jan. 1765          | 3 July 179                          |
|     | ...              | William Gordon          | July 1759                          | June 1766            | 31 May 179                          |
| 10  | ...              | James Whyte             | Dec. 1765                          | Mar. 1771            | 10 do 178                           |
|     | ...              | Robert Turing           | do 1764                            | do do                | 10 do do                            |
|     | ...              | William Duffin          | July 1767                          | do do                | 10 do do                            |
|     | ...              | Patrick Pringle         | June 1770                          | Sept. 1773           | ...                                 |
|     | ...              | George Binny            | July do                            | Oct. do              | 16 Feb. 178                         |
| 15  | ...              | David Simpson           | ...                                | ...                  | ...                                 |
|     | ...              | Nicol Mein              | July 1772                          | 19 Jan. 1778         | 16 do do                            |
|     | ...              | Terence Gahagan, M.D.   | do 1767                            | 1 Oct. 1777          | 15 do do                            |
|     | ...              | Thomas Weston           | ...                                | June 1771            | ...                                 |
|     | ...              | Finlay Fergusson        | May 1773                           | 28 May 1779          | 22 April 179                        |
| 20  | ...              | Alexander Ferrier       | Oct. do                            | 28 do do             | ...                                 |
|     | ...              | Thomas Howel            | ...                                | ...                  | ...                                 |
|     | ...              | William Roxborough.     | April 1776                         | 28 Nov. 1780         | ...                                 |
|     | ...              | Robert Rollo            | 12 March do                        | 28 do do             | ...                                 |
|     | ...              | John Briggs             | ...                                | ...                  | 9 July 179                          |
| 25  | ...              | Jeremiah Adderton       | Sept. 1776                         | 28 Nov. 1780         | 12 Sept. 179                        |
|     | ...              | Job Bulman              | ...                                | 28 do do             | ...                                 |
|     | ...              | James Richardson        | 7 June 1777                        | 7 July 1781          | 17 Oct. 179                         |
|     | ...              | Alex. Watson, M. D.     | 7 do do                            | 7 do do              | 21 Feb. 179                         |
|     | ...              | Joshua Gillespie        | ...                                | ...                  | 12 Sept. 179                        |
| 30  | ...              | Adam Blackader          | 1 July 1778                        | July 1782            | ...                                 |
|     | ...              | Anthony Simons          | June 1766                          | 22 do do             | ...                                 |
|     | ...              | William Ruddiman        | ...                                | 30 April 1784        | ...                                 |
|     | ...              | <i>Brevet Surgeons.</i> | ...                                | ...                  | ...                                 |
|     | ...              | Alexander Mein          | 1 July 1778                        | 31 Aug. 1785         | ...                                 |
| 35  | ...              | George Ogilvy           | 11 Dec. 1777                       | 31 do do             | 21 April 179                        |
|     | ...              | Alex. Anderson          | 15 do do                           | 31 do do             | 2 July 179                          |
|     | ...              | George Anderson         | Aug. 1778                          | 31 do do             | ...                                 |
|     | ...              | <i>Asst. Surgeons.</i>  | ...                                | ...                  | ...                                 |
|     | ...              | Maxwell Thomson         | Dec. 1779                          | 1 Nov. 1787          | ...                                 |
| 40  | ...              | Thomas Loord            | June 1780                          | 23 Jan. 1788         | ...                                 |
|     | ...              | Edward Stuart           | 18 May do                          | 16 Feb. do           | ...                                 |
|     | ...              | Patrick Bowie           | Aug. 1781                          | 13 May do            | 23 April 18                         |
|     | ...              | Henry Miller            | 22 May 1780                        | 11 Feb. 1789         | 11 Dec. d                           |
|     | ...              | Robert Trotter          | 8 Jan. 1781                        | 24 June do           | ...                                 |
| 40  | ...              | Charles Ogilvy          | 10 May 1780                        | 12 Jan. 1790         | ...                                 |
|     | ...              | John Kincaid            | Nov. 1782                          | 6 Mar. do            | ...                                 |
|     | ...              | John Walker             | 19 April 1783                      | 1 do do              | ...                                 |
|     | ...              | Henry Harris, M. D.     | 4 July do                          | 14 Jan. 1791         | 22 Sept. 18                         |
|     | ...              | George Bell             | 22 Aug. do                         | ...                  | ...                                 |
| 40  | ...              | Alex. Seivewright       | 10 Jan. 1784                       | 15 April 1791        | ...                                 |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                             |
|----------------------------|---------------------------|---------------|--------------------------------------|
| 14 April 1786              | ...                       | 5 Aug. 1809   |                                      |
| 14 do do                   | ...                       | 23 Mar. 1797  |                                      |
| 14 do do                   | ...                       | 24 April 1788 |                                      |
| 3 July 1790                | ...                       | 7 July 1800   | 2nd Member Medical Board, 4th April  |
| ...                        | ...                       | 4 Sept. 1793  | [1797.]                              |
| ...                        | Resigned 16th             | ...           |                                      |
| ...                        | Feb. 1788                 | ...           |                                      |
| ...                        | do do do                  | ...           |                                      |
| 30 April 1788              | ...                       | Nov. 1787     | Permitted to proceed to Europe, 14th |
| ...                        | ...                       | 12 May 1793   | [March 1792.]                        |
| ...                        | 3 July 1786               | ...           |                                      |
| 8 Mar. 1802                | ...                       | 14 April 1804 |                                      |
| 25 April 1800              | 26th Feb. 1812            | 21 Jan. 1814  | 1st Member Medical Board, 7th Au-    |
| ...                        | ...                       | ... 1787      | [gust 1809.]                         |
| ...                        | ...                       | ...           | Permitted to proceed to Europe, 19th |
| ...                        | Resigned 31st             | ...           | [June 1792.]                         |
| ...                        | Dec. 1787                 | ...           |                                      |
| ...                        | ...                       | ...           | Permitted to proceed to Europe.      |
| ...                        | ...                       | 18 Feb. 1815  |                                      |
| ...                        | ...                       | 3 Mar. 1793   |                                      |
| ...                        | 8 April 1801              | ...           |                                      |
| ...                        | ...                       | 29 Sept. 1794 |                                      |
| ...                        | ...                       | ...           | Permitted to proceed to Europe, 9th  |
| ...                        | ...                       | ...           | November 1789.                       |
| 15 April 1804              | ...                       | 13 Feb. 1807  |                                      |
| 7 Aug. 1809                | 2 April 1821              | 7 Jan. 1827   | 1st Member Medical Board, 1st March  |
| ...                        | 13 May 1800               | ...           | [1812.]                              |
| ...                        | 18 do 1792                | ...           |                                      |
| ...                        | ...                       | 19 Feb. 1803  | Invalided.                           |
| ...                        | 31 Jan. 1793              | ...           |                                      |
| ...                        | ...                       | ... 1787      |                                      |
| ...                        | 11 Aug. 1802              | ...           | Permitted to proceed to Europe, 29th |
| ...                        | ...                       | 28 April 1805 | December 1801.                       |
| ...                        | ...                       | ...           | Permitted to proceed to Europe.      |
| ...                        | ...                       | 23 May 1807   |                                      |
| ...                        | ...                       | 20 Dec. 1790  |                                      |
| ...                        | ...                       | 15 Mar. 1795  |                                      |
| ...                        | 13 June 1804              | ...           |                                      |
| ...                        | 14 Sept. 1808             | 26 Oct. 1819  | England.                             |
| ...                        | ...                       | 10 Nov. 1793  |                                      |
| ...                        | 30 July 1800              | ...           | Struck off, 24th March 1801.         |
| ...                        | ...                       | ...           | Proceeded to Europe, 6th July 1792.  |
| ...                        | ...                       | 19 Feby. 1795 |                                      |
| 1 Mar. 1812                | ...                       | 10 Aug. 1822  | 1st Member Medical Board, 2nd April  |
| ...                        | ...                       | ... 1789      | [1821.]                              |
| ...                        | ...                       | 24 Feby. 1793 |                                      |

| No. | Date of arrival. | Names.                     | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|----------------------------|------------------------------------|----------------------|-------------------------------------|
| 45  | ...              | John Laird ...             | 17 Mar. 1784                       | ...                  | ...                                 |
|     | ...              | Andrew Berry, M.D. ...     | 27 Sept. 1785                      | 15 April 1791        | 29 Dec. 1801                        |
|     | ...              | George Lipper ...          | 27 do do                           | ...                  | ...                                 |
|     | ...              | Michael Corbet ...         | 27 do do                           | ...                  | ...                                 |
|     | ...              | Thomas Brae ...            | 30 May 1786                        | ...                  | ...                                 |
| 50  | ...              | George Baird ...           | 30 do do                           | 10 Dec. 1792         | ...                                 |
|     | ...              | John Campbell ...          | 30 do do                           | ...                  | ...                                 |
|     | ...              | Fowke Moore ...            | 17 June do                         | ...                  | ...                                 |
|     | ...              | Bernard Macmahon ...       | 17 do do                           | 7 Jan. 1793          | ...                                 |
|     | ...              | James Ramsay ...           | 22 July do                         | 7 do do              | ...                                 |
| 55  | ...              | James Reid ...             | 5 Sept. do                         | ...                  | ...                                 |
|     | ...              | George Fergusson ...       | 6 Nov. do                          | ...                  | ...                                 |
|     | ...              | Charles Fleeming ...       | 6 do do                            | 5 Feby. 1793         | 18 May 1804                         |
|     | ...              | John Inglis ...            | 1 Dec. do                          | 12 Mar. do           | 18 Jan. 1805                        |
|     | ...              | Thomas Gifford ...         | 21 do do                           | ...                  | ...                                 |
| 60  | ...              | Alexander Boswell ...      | 6 Mar. 1787                        | 29 June 1793         | 29 April 1805                       |
|     | ...              | John Bannantine ...        | 6 do do                            | ...                  | ...                                 |
|     | ...              | James Cameron ...          | 9 June do                          | ...                  | ...                                 |
|     | ...              | John Duncan ...            | 9 do do                            | 29 June 1793         | 24 Mar. 1807                        |
|     | ...              | George Baillie ...         | 11 July do                         | 29 do do             | 10 Feby. 1809                       |
| 65  | ...              | Joseph Copeland ...        | 11 do do                           | ...                  | ...                                 |
|     | ...              | Maurice Fitzgerald ...     | 5 Dec. do                          | 29 June 1793         | ...                                 |
|     | ...              | Alexander Kennedy ...      | 8 June 1788                        | 25 March 1795        | 27 April 1804                       |
|     | ...              | William Todd ...           | 11 do do                           | 24 June 1796         | ...                                 |
|     | ...              | Robert Little ...          | 16 do do                           | ...                  | ...                                 |
| 70  | ...              | Thomas Thackeray ...       | 12 do do                           | 24 June 1796         | ...                                 |
|     | ...              | Samuel Barber ...          | 9 do do                            | 10 Nov. 1795         | ...                                 |
|     | ...              | John Bingham ...           | 10 do do                           | ...                  | ...                                 |
|     | ...              | George Wilson ...          | 7 do do                            | 3 March 1795         | ...                                 |
|     | ...              | Henry Morris ...           | 14 do do                           | ...                  | ...                                 |
| 75  | ...              | William Norman ...         | 3 do do                            | 28 Jan. 1795         | 17 Oct. 1809                        |
|     | ...              | J. Scudamore Hathaway ...  | 4 do do                            | ...                  | ...                                 |
|     | ...              | John Cooper ...            | 13 do do                           | ...                  | ...                                 |
|     | ...              | William Pearson ...        | 2 do do                            | ...                  | ...                                 |
|     | ...              | Francis Duncan ...         | 23 do do                           | 24 June 1796         | ...                                 |
| 80  | ...              | Alexander McKenzie ...     | 18 do do                           | 24 do do             | 7 Feby. 1812                        |
|     | ...              | Thomas Phippard ...        | 17 do do                           | 24 do do             | ...                                 |
|     | ...              | Valentine Conolly ...      | 21 do do                           | 24 do do             | ...                                 |
|     | ...              | Whitelan Ainslie, M.D. ... | 1 do do                            | 17 Oct. 1794         | 7 Aug. 1809                         |
|     | ...              | Andrew Pantou ...          | 5 do do                            | 28 Jan. 1795         | ...                                 |
| 85  | ...              | Thomas Pollard ...         | 19 do do                           | 24 June 1796         | ...                                 |
|     | ...              | Andrew Alexander ...       | 20 do do                           | ...                  | ...                                 |
|     | ...              | James Johnstone ...        | 22 do do                           | 24 June 1796         | ...                                 |
|     | ...              | James Brady ...            | 15 do do                           | ...                  | ...                                 |
|     | ...              | John Thompson ...          | 29 Jan. do                         | ...                  | ...                                 |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                                                       |
|----------------------------|---------------------------|---------------|--------------------------------------------------------------------------------|
| ...                        | ...                       | 4 Octr. 1789  |                                                                                |
| Feb. 1807                  | 10 Aug. 1814              | 24 Aug. 1833  |                                                                                |
| ...                        | ...                       | ... 1789      |                                                                                |
| ...                        | ...                       | 9 May 1798    |                                                                                |
| ...                        | ...                       | ...           | Never joined—Struck off.                                                       |
| ...                        | ...                       | ...           | Invalided, 31st Dec. 1792. Proceeded to Europe 25th Jany. 1796.                |
| ...                        | ...                       | ...           |                                                                                |
| ...                        | ...                       | 12 May 1798   |                                                                                |
| ...                        | ...                       | 5 June 1798   |                                                                                |
| ...                        | ...                       | 20 Jany. 1795 |                                                                                |
| ...                        | ...                       | 26 July 1790  |                                                                                |
| ...                        | ...                       | 23 Jany. 1792 |                                                                                |
| ...                        | 21 Jany. 1812             | ...           | Died, 20th December 1822.                                                      |
| ...                        | ...                       | 10 Feby. 1809 |                                                                                |
| ...                        | ...                       | ...           | Absent without leave.                                                          |
| July 1812                  | 17 Feb. 1819              | 4 Sept. 1835  |                                                                                |
| ...                        | ...                       | 20 Decr. 1790 |                                                                                |
| ...                        | ...                       | Nov. 1788     |                                                                                |
| Feby. 1819                 | ...                       | 10 April 1819 |                                                                                |
| Aug. 1822                  | ...                       | 20 Feb. 1826  | 2d Member Med. Board, 1st Jany. 1824; 1st Member, 28th May 1824.               |
| ...                        | ...                       | ...           | Appointed Ensign, 4th Feby. 1791.                                              |
| ...                        | 1 May 1811                | ...           |                                                                                |
| ...                        | 1 April 1812              | ...           |                                                                                |
| ...                        | ...                       | 2 Feb. 1808   | Invalided, 3rd November 1807.                                                  |
| ...                        | ...                       | 12 Nov. 1792  |                                                                                |
| ...                        | 5 Octr. 1804              | ...           |                                                                                |
| ...                        | ...                       | 17 July 1802  |                                                                                |
| ...                        | ...                       | ...           | Proceeded to Europe, 17th Sept. 1792.                                          |
| ...                        | 13 Novr. 1805             | ...           | Struck off as a casualty in the East India Directory for 1823. Date not given. |
| ...                        | ...                       | ...           | Killed at the Bowanee River, 13th September 1790.                              |
| ...                        | ...                       | 17 July 1811  |                                                                                |
| ...                        | ...                       | 21 Decr. 1797 |                                                                                |
| ...                        | ...                       | ...           | Transferred to the Bengal Establishment                                        |
| ...                        | ...                       | ...           | Not arrived. [in January 1789.                                                 |
| ...                        | 26 Novr. 1800             | ...           |                                                                                |
| ...                        | 2 May 1815                | 22 Decr. 1842 |                                                                                |
| ...                        | ...                       | 26 Octr. 1797 |                                                                                |
| ...                        | 9 Febr. 1803              | ...           |                                                                                |
| ...                        | 28 Febr. 1815             | 29 April 1837 |                                                                                |
| ...                        | ...                       | 4 Nov. 1795   |                                                                                |
| ...                        | ...                       | 9 June 1800   | Invalided, 19th November 1799.                                                 |
| ...                        | ...                       | ... 1791      |                                                                                |
| ...                        | ...                       | ...           | Struck off, 2nd January 1807.                                                  |
| ...                        | ...                       | ... 1789      |                                                                                |
| ...                        | ...                       | 26 April 1791 |                                                                                |

| Nos. | Date of arrival. | Names.               | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|----------------------|------------------------------------|----------------------|-------------------------------------|
| 90   | ...              | James Steele         | 29 June 1788                       | ...                  | ...                                 |
|      | ...              | Robert Gallaway      | 30 do                              | 24 June 1796         | ...                                 |
|      | ...              | Robert Stuart        | 5 July                             | ...                  | ...                                 |
|      | ...              | John Home            | 6 June                             | ...                  | ...                                 |
|      | ...              | Archibald Spiers     | 24 do                              | ...                  | ...                                 |
| 95   | ...              | George Anderson, Sr. | 25 do                              | 24 June 1796         | 22 May 181                          |
|      | ...              | Charles Booth        | 26 do                              | ...                  | ...                                 |
|      | ...              | Thomas Spalding      | July                               | 31 Decr. 1798        | ...                                 |
|      | ...              | John King            | 21 Nov. 1789                       | 24 June 1796         | ...                                 |
|      | ...              | John McArthur        | 22 do                              | 21 April 1797        | ...                                 |
| 100  | ...              | David Haliburton     | 23 do                              | 21 do                | ...                                 |
|      | 7 June 1790      | William Tait         | 12 Jany. 1790                      | 25 do                | 1 March 181                         |
|      | 14 Jany. 1791    | Hodson Bond          | 13 do                              | ...                  | ...                                 |
|      | 28 June 1790     | William Martin       | 14 do                              | 15 Nov. 1797         | ...                                 |
|      | ...              | Leopold Banamor      | 15 do                              | ...                  | ...                                 |
| 105  | 12 Jany. 1790    | John Goldie          | 16 do                              | 9 Jany. 1797         | 10 July 181                         |
|      | ...              | Francis Blake        | 17 do                              | ...                  | ...                                 |
|      | ...              | Thomas Beckett       | 18 do                              | ...                  | ...                                 |
|      | ...              | Henry Hawkes         | 19 do                              | ...                  | ...                                 |
|      | 5 July 1790      | John Abernethie      | 20 do                              | 16 May 1798          | ...                                 |
| 110  | 1 June 1791      | Thomas Nash          | 21 do                              | ...                  | ...                                 |
|      | ...              | J. Casterate         | 2 June                             | ...                  | ...                                 |
|      | ...              | David Wood           | 14 do                              | ...                  | ...                                 |
|      | ...              | James Barter         | 23 March                           | 20 June 1798         | ...                                 |
|      | ...              | Edward McKay         | 24 do                              | 3 Oct.               | ...                                 |
| 115  | ...              | William Bell         | 19 Jany. 1791                      | ...                  | ...                                 |
|      | ...              | Emanuel Samuel       | 20 do                              | ...                  | ...                                 |
|      | 22 Aug. 1791     | James Gilmour        | 21 do                              | 3 Oct. 1798          | 2 March 180                         |
|      | 21 Jany.         | Adam Mitchell        | 21 do                              | ...                  | ...                                 |
|      | 20 June          | Patric Nicoll        | 22 do                              | 17 Jany. 1799        | ...                                 |
| 120  | 14 Jany.         | William LeMesurier   | 23 do                              | ...                  | ...                                 |
|      | 22 Aug.          | William Stuart       | 24 do                              | ...                  | ...                                 |
|      | 20 June          | Samuel McMorris      | 25 do                              | 25 Sept. 1799        | ...                                 |
|      | 14 Jany.         | Wynne Peyton         | 26 do                              | 26 Novr.             | 3 March 18                          |
|      | 14 do            | Wm. Cookly Lettson   | 27 do                              | ...                  | ...                                 |
| 125  | 26 Sept.         | George Dunbar        | 28 do                              | 26 Novr. 1799        | ...                                 |
|      | 2 Oct.           | William Ord          | 29 do                              | 26 do                | 17 Nov. 18                          |
|      | ...              | John Price           | 31 April                           | ...                  | ...                                 |
|      | 22 Aug.          | Thomas LaRive        | 22 June                            | ...                  | ...                                 |
|      | 22 do            | Robert Macintosh     | 24 do                              | ...                  | ...                                 |
| 130  | 10 Octr.         | John Crilly          | 25 do                              | 26 Novr. 1799        | ...                                 |
|      | 22 Aug.          | John Douglas White   | 26 do                              | 26 do                | 9 Decr. 18                          |
|      | 22 do            | Thomas Huckersby     | 27 do                              | ...                  | ...                                 |
|      | 22 do            | James Munro          | 28 do                              | ...                  | ...                                 |
|      | 10 Octr.         | Donald Scott         | 29 do                              | ...                  | ...                                 |
| 135  | 8 Aug.           | James Dalton         | 1 July                             | 14 May 1800          | 15 Decr. 18                         |
|      | 22 do            | Thomas Skarrow       | 2 do                               | ...                  | ...                                 |
|      | 18 June 1792     | Charles Oram         | 2 do                               | ...                  | ...                                 |
|      | 20 do 1791       | James Wright         | 3 do                               | ...                  | ...                                 |
|      | 10 Octr.         | Robert Bryder        | 4 do                               | ...                  | ...                                 |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                                                  |
|----------------------------|---------------------------|---------------|---------------------------------------------------------------------------|
| ...                        | ...                       | ...           | Appointed Surgeon to H. M's 52d Regiment, 12th Sept. 1791.                |
| ...                        | ...                       | 5 July 1803   |                                                                           |
| ...                        | ...                       | ...           |                                                                           |
| ...                        | ...                       | Decr. 1789    |                                                                           |
| ...                        | ...                       | 14 May 1798   |                                                                           |
| ...                        | ...                       | 4 Aug. 1810   |                                                                           |
| ...                        | ...                       | 2 Oct. 1789   |                                                                           |
| ...                        | ...                       | 8 Nov. 1812   | Invalided, 22nd December 1807.                                            |
| ...                        | ...                       | ...           | Dismissed, 10th May 1803.                                                 |
| ...                        | ...                       | 17 Sept. 1799 |                                                                           |
| ...                        | ...                       | 22 Nov. 1800  |                                                                           |
| ...                        | 16 Feby. 1813             | 7 May 1827    |                                                                           |
| ...                        | ...                       | 28 May 1792   |                                                                           |
| ...                        | ...                       | 9 Sept. 1804  |                                                                           |
| ...                        | ...                       | ...           | Not arrived.                                                              |
| 11 April 1819              | 31 Decr. 1823             | 11 June 1855  | 2nd Member Medical Board, 2nd April [1821; 1st Member, 11th August 1822.  |
| ...                        | ...                       | 7 Mar. 1794   |                                                                           |
| ...                        | ...                       | ...           | 1791                                                                      |
| ...                        | ...                       | 28 Nov. 1796  |                                                                           |
| ...                        | ...                       | 21 Dec. 1804  |                                                                           |
| ...                        | ...                       | ...           | Proceeded to Europe, 24th August 1792.                                    |
| ...                        | ...                       | 1 Feb. 1798   |                                                                           |
| ...                        | ...                       | ...           |                                                                           |
| ...                        | ...                       | 22 Sept. 1807 | } Pensioned, 4th October 1803.                                            |
| ...                        | ...                       | 21 Feb. 1810  |                                                                           |
| ...                        | ...                       | ...           | Not arrived.                                                              |
| ...                        | 21 Sept. 1792             | ...           |                                                                           |
| ...                        | 22 April 1818             | 6 May 1828    |                                                                           |
| ...                        | ...                       | ...           | Transferred to the Bengal Establishment                                   |
| ...                        | ...                       | 21 Aug. 1804  | [4th June 1792.                                                           |
| ...                        | ...                       | 2 Oct. 1793   |                                                                           |
| ...                        | ...                       | 18 May 1799   |                                                                           |
| ...                        | 13 Feby. 1805             | 29 April 1850 |                                                                           |
| 1 Jan'y. 1824              | 16 June 1826              | 10 Oct. 1848  | 2nd Member Medical Board, 28th May [1824; 1st Member, 21st February 1826. |
| ...                        | ...                       | 2 June 1794   |                                                                           |
| ...                        | ...                       | 25 Aug. 1805  |                                                                           |
| ...                        | 17 Mar. 1815              | 23 May 1818   |                                                                           |
| ...                        | ...                       | ...           | Dismissed from the Service, 5th Oct. 1791.                                |
| ...                        | ...                       | 19 May 1795   |                                                                           |
| ...                        | ...                       | 4 June 1792   |                                                                           |
| ...                        | ...                       | 30 Sept. 1800 |                                                                           |
| 2 April 1821               | ...                       | 27 May 1824   | 2nd Member, 11th August 1822; 1st Mem-                                    |
| ...                        | ...                       | 29 Sept. 1793 | ber, 1st January, 1824.                                                   |
| ...                        | ...                       | ...           | Proceeded to Europe, 8th April 1793.                                      |
| ...                        | ...                       | 15 Oct. 1792  |                                                                           |
| ...                        | ...                       | 16 Sept. 1823 |                                                                           |
| ...                        | ...                       | 22 Oct. 1792  |                                                                           |
| ...                        | ...                       | 12 Aug. 1798  |                                                                           |
| ...                        | ...                       | 18 April 1794 |                                                                           |
| ...                        | ...                       | 15 Nov. 1798  |                                                                           |



| Nos. | Date of arrival. | Names.                 | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|------------------------|------------------------------------|----------------------|-------------------------------------|
| 140  | 26 Sept. 1791    | John Steady ...        | 5 July 1791                        | 14 May 1800          | 6 Feby. 1817                        |
|      | ...              | Ephraim Morton ...     | 6 do                               | ...                  | ...                                 |
|      | ...              | Richd. Jackson Todd.   | 7 do                               | ...                  | ...                                 |
|      | ...              | Michael O'Donaghoe...  | 8 do                               | 19 Aug. 1800         | ...                                 |
|      | ...              | William Betty ...      | 9 do                               | 19 do                | ...                                 |
| 145  | ...              | Charles O'Neil ...     | 10 do                              | ...                  | ...                                 |
|      | 29 April 1793    | Jacob C. Fancourt ...  | 11 Aug. 1792                       | ...                  | ...                                 |
|      | 13 Aug. 1792     | Anthony Babington...   | 13 do                              | 19 Aug. 1800         | ...                                 |
|      | 20 Jany. 1794    | John Field McLean...   | 14 do                              | ...                  | ...                                 |
|      | 21 Sept. 1792    | Archibald McMillan...  | 15 do                              | ...                  | ...                                 |
| 150  | 17 Decr. 1793    | Henry Wyse ...         | 16 do                              | 2 Decr. 1800         | ...                                 |
|      | 21 Sept. 1792    | Joseph Street ...      | 17 do                              | 11 do                | ...                                 |
|      | 27 do            | Robert Addison ...     | 18 do                              | 31 Mar. 1801         | ...                                 |
|      | 20 Jany. 1794    | Wm. Colhoun Sterling   | 19 do                              | 14 April             | 15 Nov. 1817                        |
|      | 27 Aug. 1792     | David Mudie ...        | 20 do                              | 10 June              | ...                                 |
| 155  | 27 do            | Richard Stone ...      | 21 do                              | 16 Aug.              | ...                                 |
|      | 6 do             | Robert Reddick ...     | 22 do                              | ...                  | ..                                  |
|      | 10 Decr.         | John Decks ...         | 22 do                              | ...                  | ...                                 |
|      | 27 Aug.          | Samuel Lockart ...     | 23 do                              | ...                  | ..                                  |
|      | 7 Jany. 1793     | William Pritchard ...  | 24 do                              | 13 Jany. 1802        | 1 May 1816                          |
| 160  | 27 Aug. 1792     | John Carnie ...        | 25 do                              | 2 Mar.               | ...                                 |
|      | 28 Sept.         | Duncan McGibbon ...    | 26 do                              | 28 July              | ...                                 |
|      | ...              | Archibald Little ...   | 8 July 1794                        | ...                  | ...                                 |
|      | ...              | William Yates ...      | 26 Dec. 1795                       | 3 Feb. 1803          | ...                                 |
|      | 15 Jany. 1796    | John James ...         | 27 do                              | 28 April             | ...                                 |
| 165  | 21 March         | John Underwood ...     | 28 do                              | 7 July               | ...                                 |
|      | 21 Dec. 1795     | James Peat ...         | 29 do                              | ...                  | ...                                 |
|      | 21 do            | Wm. Robert Bulman      | 30 do                              | 2 Aug. 1803          | ...                                 |
|      | 21 Nov. 1796     | Simon Howard ...       | 31 do                              | 5 Oct.               | 18 Feb. 1819                        |
|      | 22 Feb.          | John Stevenson ...     | 1 Jany. 1796                       | ...                  | ...                                 |
| 170  | 14 Sept. 1797    | Thomas Owen ...        | 3 do                               | 21 Jany. 1804        | 11 April 1819                       |
|      | 21 Nov. 1796     | Arthur Connell ...     | 4 do                               | 1 May                | ...                                 |
|      | 26 Dec.          | William Fallowfield... | 5 do                               | 14 June              | ...                                 |
|      | 21 Nov.          | Alexander Inverarity.  | 6 do                               | 10 Sept.             | ...                                 |
|      | 16 Jany. 1797    | Benjamin Humpage...    | 7 do                               | 21 do                | ...                                 |
| 175  | 16 do            | Joseph Vernon ...      | 8 do                               | ...                  | ...                                 |
|      | 21 Decr. 1795    | Joseph Daniel ...      | 9 do                               | ...                  | ...                                 |
|      | 21 Aug. 1798     | Robert Adamson ...     | ... 1797                           | ...                  | ...                                 |
|      | 6 Feb. 1797      | Charles Brydie ...     | 10 Jany. 1796                      | ...                  | ...                                 |
|      | 21 Dec. 1795     | Colin Rogers, M.D. ... | 11 do                              | 21 Sept. 1804        | 15 Oct. 1820                        |
| 180  | 20 March 1797    | Henry Holloway ...     | 12 do                              | ...                  | ...                                 |
|      | 26 Dec. 1796     | Thomas Hart Davis...   | 13 do.                             | 21 Sept. 1804        | 3 April 1821                        |
|      | 21 do 1795       | Alex. Noble Brown...   | 14 do                              | ...                  | ...                                 |
|      | 21 Nov. 1796     | John Gordon ...        | 15 do                              | ...                  | ...                                 |
|      | 21 do            | Wm. McIntosh ...       | 16 do                              | 21 Sept. 1804        | ...                                 |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                                                               |
|----------------------------|---------------------------|---------------|----------------------------------------------------------------------------------------|
| ...                        | ...                       | 14 Nov. 1817  | Struck off, 6th January 1794.                                                          |
| ...                        | ...                       | Nov. 1793     |                                                                                        |
| ...                        | ...                       | 21 June 1806  | Dismissed from the service 1803. Restored [7th March 1805.                             |
| ...                        | ...                       | 6 May 1810    |                                                                                        |
| ...                        | ...                       | 3 Nov. 1797   |                                                                                        |
| ...                        | ...                       | 5 April 1800  |                                                                                        |
| ...                        | ...                       | 1 Aug. 1803   |                                                                                        |
| ...                        | ...                       | 15 Aug. 1794  |                                                                                        |
| ...                        | ...                       | 25 Dec. 1793  | 2nd Member, 21st February 1826; 1st [Member, 17th June 1826.                           |
| ...                        | ...                       | 25 Sept. 1809 |                                                                                        |
| ...                        | ...                       | 10 June 1809  |                                                                                        |
| ...                        | ...                       | 5 Nov. 1801   |                                                                                        |
| ...                        | ...                       | ...           |                                                                                        |
| 21 Feb. 1836               | 21 Feb. 1831              | 21 Jan. 1807  | Transferred to the Bengal Establishment, 20th December, 1792.                          |
| ...                        | ...                       | 22 Sept. 1806 |                                                                                        |
| ...                        | ...                       | ...           | 2nd Member, 17th June 1826.                                                            |
| ...                        | ...                       | — Aug. 1796   |                                                                                        |
| ...                        | ...                       | 23 April 1797 |                                                                                        |
| ...                        | ...                       | 30 Nov. 1847  |                                                                                        |
| 28 May 1824                | 1 July 1828               | 17 Dec. 1804  | Pensioned, August 1802.                                                                |
| ...                        | 15 Mar. 1805              | 26 Aug. 1804  |                                                                                        |
| ...                        | ...                       | — July 1809   |                                                                                        |
| ...                        | ...                       | 16 Oct. 1825  |                                                                                        |
| ...                        | 29 July 1814              | ...           | Pensioned, 27th November 1804.                                                         |
| ...                        | 22 Feb. 1814              | — April 1802  |                                                                                        |
| ...                        | ...                       | 1806          |                                                                                        |
| ...                        | ...                       | ...           |                                                                                        |
| 17 June 1836               | 17 June 1831              | ...           | 3rd Member, 17th June 1826; 2nd Member, 1st July 1828; 1st Member, 22nd February 1831. |
| ...                        | ...                       | 20 Jany. 1804 |                                                                                        |
| ...                        | ...                       | ...           | On board the Matilda Cartell (Passage to England.)                                     |
| 1 July 1828                | ...                       | 14 do 1833    |                                                                                        |
| ...                        | ...                       | ...           | 2nd Member, 22nd Febr. 1831; 1st Member, 18th June 1831.                               |
| ...                        | ...                       | 27 Oct. 1819  |                                                                                        |
| ...                        | ...                       | 3 Aug. 1819   |                                                                                        |
| ...                        | ...                       | 22 Sep. 1808  |                                                                                        |
| ...                        | ...                       | 27 Aug. 1806  |                                                                                        |
| ...                        | ...                       | 31 May 1800   |                                                                                        |
| ...                        | ...                       | 6 do 1797     |                                                                                        |
| ...                        | ...                       | 1 Dec. 1799   |                                                                                        |
| ...                        | ...                       | 24 June 1797  |                                                                                        |
| ...                        | 23 May 1825               | 25 Nov. 1855  |                                                                                        |
| ...                        | ...                       | ...           |                                                                                        |
| ...                        | ...                       | ...           |                                                                                        |
| 21 Sept. 1832              | 22 Feb. 1836              | 14 Feb. 1845  | Killed at Kandy in 1801.                                                               |
| ...                        | ...                       | 22 June 1798  |                                                                                        |
| ...                        | ...                       | 7 Feb. 1802   |                                                                                        |
| ...                        | 15 Feb. 1815              | 19 Jany. 1847 |                                                                                        |
| ...                        | ...                       | ...           | 2nd Member, 21st September 1832; 1st Member, 18th January 1833.                        |
| ...                        | ...                       | ...           |                                                                                        |

| Nos. | Date of arrival. | Names.                    | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|---------------------------|------------------------------------|----------------------|-------------------------------------|
| 185  | 2 Sept. 1799     | Daniel Gilchrist ...      | 1 Jany. 1798                       | ...                  | ...                                 |
|      | 5 Oct. 1798      | John Hay ...              | 1 Jany. 1797                       | 6 Nov. 1804          | 11 Aug. 1822                        |
|      | 5 do             | William Ingledew ...      | do                                 | 28 do                | ...                                 |
|      | 5 do             | Gavin Trotter ...         | do                                 | 17 Dec.              | ...                                 |
|      | 5 do             | David Scott ...           | do                                 | 21 do                | ...                                 |
| 190  | 5 do             | Aaron Tozer ...           | do                                 | 29 Mar. 1805         | ...                                 |
|      | 21 Jany. 1799    | Alfred Jones ...          | do                                 | do                   | ...                                 |
|      | 20 Nov. 1798     | William Thomas ...        | do                                 | do                   | ...                                 |
|      | 2 July 1799      | Gilbert Briggs ...        | do                                 | do                   | ...                                 |
|      | 5 Oct. 1798      | John Grant ...            | do                                 | do                   | ...                                 |
| 195  | 5 do             | Macduff Cordiner ...      | do                                 | do                   | ...                                 |
|      | 17 Aug.          | Jeremiah Scarman ...      | do                                 | do                   | 16 Jany. 1823                       |
|      | ...              | J. R. S. Shuttleworth ... | do                                 | ...                  | ...                                 |
|      | 2 Sept. 1799     | William Horsman ...       | 1 Jany. 1798                       | 29 Mar. 1805         | 2 Feb. 1823                         |
|      | 23 Dec.          | Bellington Loftie ...     | do                                 | do                   | ...                                 |
| 200  | 12 Aug.          | Henry Palmer ...          | do                                 | ...                  | ...                                 |
|      | 18 July 1800     | Anthony Taylor ...        | do                                 | 29 Mar. 1805         | ...                                 |
|      | 12 Aug. 1799     | Patrick Maxtone ...       | do                                 | ...                  | ...                                 |
|      | 23 Dec.          | John H. Jones ...         | do                                 | 29 Mar. 1805         | 2 Feb. 1823                         |
|      | 31 Mar. 1800     | Thomas Evans ...          | do                                 | do                   | 1 Jany. 1824                        |
| 205  | 21 June 1802     | Hans Gordon ...           | do                                 | 24 Sept. 1805        | ...                                 |
|      | 11 Aug. 1800     | John Jameson ...          | do                                 | do                   | ...                                 |
|      | 2 Sept. 1799     | James FoGambée ...        | do                                 | do                   | ...                                 |
|      | 3 Aug. 1801      | Alexander Stewart ...     | do                                 | do                   | ...                                 |
| 210  | 16 Mar.          | John Alves ...            | 29 April 1799                      | ...                  | ...                                 |
|      | 23 do            | John White ...            | do                                 | 24 Sept. 1805        | ...                                 |
|      | 11 Oct. 1800     | Robert C. Sherwood ...    | do                                 | do                   | ...                                 |
|      | 18 July          | W. D. Greaves ...         | do                                 | do                   | ...                                 |
|      | 16 Mar. 1801     | John Alex. Andrew ...     | do                                 | do                   | ...                                 |
|      | 8 Dec. 1800      | James Annesley ...        | do                                 | do                   | 15 Feb. 1821                        |
| 215  | 17 Aug. 1801     | James Paterson ...        | do                                 | 2 Jany. 1807         | ...                                 |
|      | 16 Mar.          | John Best ...             | do                                 | do                   | ...                                 |
|      | 16 do            | Charles McCabe ...        | do                                 | do                   | 28 May 1821                         |
|      | ...              | Benjamin Heyne ...        | do                                 | do                   | ...                                 |
|      | 3 Aug. 1801      | Robert Edwards ...        | 1 Jany. 1800                       | ...                  | ...                                 |
| 220  | 3 do             | Hugh Dove ...             | do                                 | 2 Jany. 1807         | ...                                 |
|      | 17 do            | John Campbell ...         | do                                 | do                   | ...                                 |
|      | 8 Feb. 1802      | John Cormick ...          | do                                 | do                   | ...                                 |
|      | 3 Aug. 1801      | John Boodle ...           | do                                 | do                   | ...                                 |
|      | 2 Nov.           | A. Lockhart Smith ...     | do                                 | do                   | ...                                 |
| 225  | 3 Aug.           | George Alexander ...      | do                                 | do                   | ...                                 |

| Promoted to Medical Board. | Retired from the Service. | Died.                        | Remarks.                                                                                                                                                                                      |
|----------------------------|---------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 Feb. 1831                | 25 Feb. 1836              | 10 Mar. 1801<br>29 Dec. 1842 | 2nd Member, 18th June 1831; appointed again 3rd Member, vide G. O. No 215 dated 21st Sept. 1832; 2nd Member, 18th January, 1833.                                                              |
| ...                        | 10 Jany. 1821             | 31 do 1849                   |                                                                                                                                                                                               |
| ...                        | ...                       | 17 April 1807                |                                                                                                                                                                                               |
| ...                        | ...                       | 4 June 1816                  |                                                                                                                                                                                               |
| ...                        | ...                       | 12 Mar. 1814                 | Struck off, 18th July 1809.                                                                                                                                                                   |
| ...                        | 6 June 1804               | ...                          |                                                                                                                                                                                               |
| ...                        | ...                       | 4 Nov. 1820                  |                                                                                                                                                                                               |
| ...                        | ...                       | 24 Jany. 1814                |                                                                                                                                                                                               |
| ...                        | ...                       | 13 April 1821                | Invalided, 19th December 1819.                                                                                                                                                                |
| ...                        | ...                       | 14 do 1830                   |                                                                                                                                                                                               |
| ...                        | ...                       | 11 July 1803                 |                                                                                                                                                                                               |
| ...                        | 19 Jany. 1823             | ...                          |                                                                                                                                                                                               |
| ...                        | ...                       | 11 Mar. 1812                 |                                                                                                                                                                                               |
| ...                        | ...                       | 10 do 1801                   |                                                                                                                                                                                               |
| ...                        | ...                       | 22 do 1808                   |                                                                                                                                                                                               |
| ...                        | ...                       | 11 July 1803                 |                                                                                                                                                                                               |
| ...                        | ...                       | 30 June 1825                 |                                                                                                                                                                                               |
| ...                        | 19 Feb. 1829              | 11 April 1845                |                                                                                                                                                                                               |
| ...                        | ...                       | 18 June 1820                 |                                                                                                                                                                                               |
| ...                        | ...                       | 17 Feb. 1812                 |                                                                                                                                                                                               |
| ...                        | ...                       | 25 June 1830                 | Invalided, 31st March 1819. Placed on the Retired List in England by the H. C. of Directors.                                                                                                  |
| ...                        | ...                       | 11 Feb. 1820                 |                                                                                                                                                                                               |
| ...                        | ...                       | May 1802                     |                                                                                                                                                                                               |
| ...                        | ...                       | ...                          | Struck off, 12th December 1807.                                                                                                                                                               |
| ...                        | 16 Mar. 1822              | 7 Feb. 1850                  |                                                                                                                                                                                               |
| ...                        | ...                       | 29 Mar. 1816                 |                                                                                                                                                                                               |
| ...                        | ...                       | 15 April 1817                |                                                                                                                                                                                               |
| 8 June 1831                | 18 Jany. 1838             | 4 Dec. 1847                  | { Appointment of a Member of the Medical Board, cancelled, vide G. O. No. 215, dated 21st Sept. 1832; 3rd Member, 18th January 1833; 2nd Member, 23rd Feby. 1836; 1st Member, 26th Feb. 1836. |
| 8 Jany. 1833               | ...                       | ...                          | Struck off, 19th June 1821. Died under transportation at Botany Bay.                                                                                                                          |
| ...                        | ...                       | ...                          |                                                                                                                                                                                               |
| ...                        | ...                       | 31 Aug. 1808                 |                                                                                                                                                                                               |
| ...                        | 15 Jany. 1830             | 30 April 1863                |                                                                                                                                                                                               |
| ...                        | ...                       | 6 Feb. 1819                  |                                                                                                                                                                                               |
| ...                        | ...                       | 20 Sept. 1802                |                                                                                                                                                                                               |
| ...                        | ...                       | 3 June 1814                  |                                                                                                                                                                                               |
| ...                        | ...                       | 23 Mar. 1816                 |                                                                                                                                                                                               |
| ...                        | ...                       | 28 Sept. 1833                |                                                                                                                                                                                               |
| ...                        | ...                       | 31 Dec. 1809                 |                                                                                                                                                                                               |
| ...                        | ...                       | 12 Feb. 1814                 |                                                                                                                                                                                               |
| ...                        | 9 Aug. 1818               | 4 Aug. 1846                  |                                                                                                                                                                                               |

| No. | Date of arrival. | Names.                    | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|---------------------------|------------------------------------|----------------------|-------------------------------------|
| 230 | 17 Aug. 1801     | John Stewart ...          | 1 Jany. 1800                       | ...                  | ...                                 |
|     | 17 do            | Thomas Stephen ...        | do                                 | ...                  | ...                                 |
|     | 3 do             | James Wyse ...            | do                                 | 18 April 1807        | 26 Oct. 1824                        |
|     | 8 Feby. 1802     | Thomas Trotter ...        | do                                 | 23 May               | 10 Feby 1826                        |
|     | 26 April         | James Howel Jones ...     | do                                 | 23 Sept.             | ...                                 |
| 235 | 3 Aug. 1801      | Alexander Tennant ...     | do                                 | ...                  | ...                                 |
|     | 8 do             | Henry Williamson ...      | do                                 | 4 Novr. 1807         | ...                                 |
|     | 21 June 1802     | Daniel Ainslie, M. D. ... | do                                 | 12 Dec.              | ...                                 |
|     | 26 July          | John Hurley ...           | do                                 | ...                  | ...                                 |
|     | 28 June          | John Jeffries ...         | do                                 | 23 Dec. 1807         | ...                                 |
| 240 | 21 do            | Henry Painter ...         | ...                                | ...                  | ...                                 |
|     | 28 do            | Williams Wilyams ...      | 1 Jany. 1801                       | ...                  | ...                                 |
|     | 25 do            | Henry Fowle ...           | do                                 | ...                  | ...                                 |
|     | 12 July          | Thomas Dickson ...        | do                                 | 28 March 1808        | ...                                 |
|     | 6 Sept.          | Samuel Riviere ...        | do                                 | 20 Jany. 1814        | ...                                 |
| 245 | 6 do             | Samuel Dyer ...           | do                                 | 12 Feby.             | 4 July 1826                         |
|     | 11 Octr.         | William Currie ...        | do                                 | 22 do                | ...                                 |
|     | 6 Sept.          | John Whitefield ...       | do                                 | ...                  | ...                                 |
|     | 6 do             | William Scot ...          | do                                 | 13 Mar. 1814         | 5 Octr. 1827                        |
|     | 27 do            | William S. Mitchell ...   | do                                 | 3 June               | ...                                 |
| 250 | 27 do            | Kenneth McCaulay ...      | do                                 | 29 July              | 5 Octr. 1827                        |
|     | 27 Decr.         | Mathew S. Moore, ...      | do                                 | 10 Aug.              | 1 July 1828                         |
|     | 22 May 1803      | James Gordon ...          | do                                 | 1 Jany. 1815         | ...                                 |
|     | 22 do            | James Stock ...           | ...                                | ...                  | ...                                 |
|     | 22 do            | Benjamin P. Longdill.     | 6 Sept. 1802                       | 1 Jany. 1815         | ...                                 |
| 255 | 10 Aug.          | Arch. D. Stewart ...      | — 1802                             | ...                  | ...                                 |
|     | 10 do            | George Anderson, Jr.      | 6 Sept. 1802                       | 1 Jany. 1815         | ...                                 |
|     | 10 do            | Duncan Brodie ...         | ...                                | ...                  | ...                                 |
|     | 22 do            | John Upton ...            | ...                                | ...                  | ...                                 |
|     | 22 do            | John Leydon, M. D. ...    | — 1802                             | ...                  | ...                                 |
| 260 | 29 do            | Samuel Cotton ...         | ...                                | ...                  | ...                                 |
|     | 9 Sept.          | Andrew High ...           | ...                                | ...                  | ...                                 |
|     | 12 do            | James B. Pender ...       | 6 Sept. 1802                       | 1 Jany. 1815         | ...                                 |
|     | 12 do            | John Balmain ...          | ...                                | ...                  | ...                                 |
|     | 26 do            | George Robt. Rose ...     | ...                                | ...                  | ...                                 |
| 265 | 6 Jany. 1804     | James Johnston ...        | ...                                | ...                  | ...                                 |
|     | 6 do             | Andrew Napier ...         | ...                                | ...                  | ...                                 |
|     | 6 do             | Thomas Wyllie ...         | 6 Sept. 1802                       | 1 Jany. 1815         | ...                                 |
|     | 6 Feby.          | Charles MacDonald ...     | ...                                | ...                  | ...                                 |
|     | 23 July          | John Dean ...             | 6 Sept. 1802                       | 15 Feb. 1815         | ...                                 |
| 270 | 23 do            | W. Mackenzie, M. D. ...   | 22 May 1803                        | 1 Mar.               | ...                                 |
|     | 23 do            | John Underwood ...        | 22 do                              | 17 Mar.              | 8 Octr. 1824                        |
|     | 10 Sept.         | Alex. McCaskill, M. D.    | 22 do                              | ...                  | ...                                 |
|     | 30 July          | James Strachan ...        | ...                                | ...                  | ...                                 |
|     | 22 Octr.         | John Jullion ...          | ...                                | ...                  | ...                                 |
|     | 27 Decr.         | Thomas Hendry ...         | 22 May 1803                        | 2 May 1815           | ...                                 |
|     | 14 Feb. 1805     | James Cuddy ...           | 22 do                              | 22 Mar. 1816         | 16 Decr. 1824                       |
|     | 15 July          | S. Martin Stephenson      | 22 do                              | 29 do                | 20 Feb. 1824                        |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                                                          |
|----------------------------|---------------------------|---------------|-----------------------------------------------------------------------------------|
| ...                        | ...                       | 9 Feby. 1803  |                                                                                   |
| ...                        | ...                       | 29 Octr. 1803 |                                                                                   |
| ...                        | ...                       | 7 do 1828     |                                                                                   |
| ...                        | ...                       | 26 Sept. 1826 |                                                                                   |
| ...                        | ...                       | 24 Nov. 1818  |                                                                                   |
| ...                        | ...                       | 23 Octr. 1803 |                                                                                   |
| ...                        | ...                       | 9 Aug. 1808   |                                                                                   |
| ...                        | ...                       | 21 July 1816  |                                                                                   |
| ...                        | ...                       | 17 June 1803  |                                                                                   |
| ...                        | 30 Sept. 1828             | ...           |                                                                                   |
| ...                        | ...                       | 21 Nov. 1803  |                                                                                   |
| ...                        | ...                       | 29 do 1805    |                                                                                   |
| ...                        | ...                       | 7 Mar. 1810   |                                                                                   |
| ...                        | ...                       | 19 Jany. 1814 |                                                                                   |
| ...                        | ...                       | 24 Octr. 1816 | Invalided, 7th August 1816.                                                       |
| ...                        | 15 Decr. 1828             | 12 Decr. 1845 |                                                                                   |
| ...                        | 5 do 1821                 | ...           |                                                                                   |
| ...                        | ...                       | 31 May 1803   | On board the <i>Baring</i> passage home.                                          |
| ...                        | 30 May 1834               | 21 Oct. 1863  |                                                                                   |
| ...                        | ...                       | 24 Novr. 1819 |                                                                                   |
| 3 Feby. 1836               | ...                       | 2 Feby. 1841  | 3rd Mem., 23rd Feby. 1836; 2nd Mem., 26th Feby. 1836; 1st Mem., 19th Jany. 1838.  |
| ...                        | 31 Decr. 1832             | ...           |                                                                                   |
| ...                        | ...                       | 9 Novr. 1824  |                                                                                   |
| ...                        | ...                       | 24 April 1809 |                                                                                   |
| ...                        | 22 Jany. 1823             | ...           | Struck off, 14th March 1810.                                                      |
| ...                        | ...                       | ...           |                                                                                   |
| ...                        | ...                       | 24 Aug. 1819  |                                                                                   |
| ...                        | ...                       | 20 May 1811   |                                                                                   |
| ...                        | ...                       | 25 April 1805 |                                                                                   |
| ...                        | ...                       | 28 Aug. 1811  |                                                                                   |
| ...                        | ...                       | 12 do 1811    | Pensioned, 19th June 1810.                                                        |
| ...                        | 29 Octr. 1805             | ...           | Resigned the Service.                                                             |
| ...                        | ...                       | 27 Aug. 1817  |                                                                                   |
| ...                        | ...                       | 7 Sept. 1811  |                                                                                   |
| ...                        | ...                       | 18 Dec. 1807  |                                                                                   |
| ...                        | ...                       | 10 Dec. 1804  |                                                                                   |
| ...                        | ...                       | 20 Nov. 1808  | Lost in the ship <i>Glory</i> .                                                   |
| ...                        | ...                       | 5 Nov. 1818   |                                                                                   |
| ...                        | ...                       | ...           | Dismissed from the Service, 17th June 1812.                                       |
| ...                        | 14 May 1827               | ...           |                                                                                   |
| ...                        | 1 April 1830              | ...           |                                                                                   |
| 6 Feb. 1836                | 26 Feby. 1839             | 30 Nov. 1839  | 3rd Member, 26th February 1836; 2nd Member, 19th January, 1838.                   |
| ...                        | ...                       | 8 Sept. 1815  |                                                                                   |
| ...                        | ...                       | 9 May 1810    |                                                                                   |
| ...                        | ...                       | 10 do 1805    |                                                                                   |
| ...                        | 7 April 1819              | ...           |                                                                                   |
| 9 Jany. 1838               | ...                       | 17 Decr. 1841 | 3rd Member, 19th Jany. 1838; 2nd Member 26th Feb. 1839; 1st Member, 2d Feb. 1841. |
| ...                        | ...                       | 18 Aug. 1833  | Died on the passage to England.                                                   |

129 *General List of the late Hon'ble Com.'s Medical Establish-*

| No. | Date of Arrival. | Names.                  | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|-------------------------|------------------------------------|----------------------|-------------------------------------|
| 275 | 23 Aug. 1805     | William McDowell ...    | 23 July 1804                       | 4 June 1816          | ...                                 |
|     | 23 do            | Henry W. Ramsey ...     | ...                                | ...                  | ...                                 |
|     | 26 Feb.          | George Hume ...         | ...                                | ...                  | ...                                 |
|     | 15 do            | Fabricious Timon ...    | ...                                | ...                  | ...                                 |
| 280 | 18 April         | Lacy Gray Ford ...      | 23 July 1804                       | 21 July 1816         | 1 Jan. 1831                         |
|     | 28 June          | William Jones, Senior.  | do                                 | ...                  | ...                                 |
|     | 23 April         | John Burton ...         | do                                 | 7 Aug. 1816          | ...                                 |
|     | 23 do            | William Haines ...      | do                                 | 15 April 1817        | 22 Feb. 1831                        |
| 285 | 5 March          | John Rich ...           | do                                 | 27 Aug.              | ...                                 |
|     | 5 do             | James McDonald ...      | ...                                | ...                  | ...                                 |
|     | 23 April         | Richard Gibbon ...      | 23 July 1804                       | 15 Nov. 1817         | 1 Feb. 1831                         |
|     | —                | Alexander Johnston..    | do                                 | 22 April 1818        | ...                                 |
| 290 | —                | Mathew Christie, M. D.  | —                                  | ...                  | ...                                 |
|     | 11 April 1806    | John Cooke ...          | 15 July 1805                       | 1 May 1818           | ...                                 |
|     | 28 June          | William Jones, Junior   | do                                 | 10 Aug.              | ...                                 |
|     | 28 do            | Robert Hunter ...       | do                                 | 1 Sept.              | ...                                 |
| 295 | 28 do            | Robert Goldie ...       | do                                 | ...                  | ...                                 |
|     | 28 do            | George Adams ...        | do                                 | 1 Sept. 1818         | 3 Feb. 1831                         |
|     | 28 do            | George Agnew ...        | do                                 | ...                  | ...                                 |
|     | 27 Aug.          | George Bruce, M. D....  | do                                 | 1 Sept. 1818         | ...                                 |
| 300 | 27 do            | John Rule ...           | do                                 | ...                  | ...                                 |
|     | 28 do            | Arth. Bedford Peppin.   | do                                 | 25 Nov. 1818         | ...                                 |
|     | 14 Jan. 1807     | Thomas Sergeant ...     | do                                 | 7 Feb. 1819          | ...                                 |
|     | 14 do            | Robert Richardson ...   | do                                 | 18 do                | ...                                 |
| 305 | 14 Nov. 1806     | Thomas Cother ...       | do                                 | 1 April              | ...                                 |
|     | 29 Dec.          | James Tcwell, A.B. ...  | do                                 | 8 do                 | 18 June 1831                        |
|     | 29 do            | Ramsey Sladen ...       | do                                 | 11 do                | 3 Feb. 1831                         |
|     | 12 Jan. 1807     | John Milne ...          | do                                 | ...                  | ...                                 |
| 310 | 13 March         | John McLeod ...         | do                                 | 3 July 1819          | 28 Mar. 1831                        |
|     | 13 do            | Donald McAndrew ...     | do                                 | 4 Aug.               | ...                                 |
|     | 13 do            | William Fleet Newlyn    | do                                 | 28 Oct.              | 15 Jan. 1831                        |
|     | 13 do            | R. Nettle Croker, M.D.  | do                                 | ...                  | ...                                 |
| 315 | 13 do            | James Kellie, M.D. .... | do                                 | 28 Oct. 1819         | ...                                 |
|     | 13 do            | Charles Stewart ...     | do                                 | ...                  | ...                                 |
|     | 12 June          | John Norris ...         | do                                 | 25 Nov. 1819         | 18 Mar. 1831                        |
|     | 12 do            | John Jones, Senior...   | do                                 | ...                  | ...                                 |
| 320 | 12 do            | Archibald Spiers ...    | do                                 | 20 Dec. 1819         | ...                                 |
|     | 12 do            | Thomas Sutton ...       | do                                 | 12 Feb. 1820         | ...                                 |
|     | 12 do            | William S. Anderson.    | do                                 | 4 June               | ...                                 |
|     | 12 do            | William Tolme ...       | do                                 | ...                  | ...                                 |
| 325 | 6 July           | M. Morley Houghton.     | 11 April 1806                      | ...                  | ...                                 |
|     | 6 do             | Charles Morgan ...      | do                                 | ...                  | ...                                 |
|     | 6 do             | Stephen Parrock ...     | do                                 | 19 June 1820         | ...                                 |
|     | 8 do             | Thomas Brown ...        | do                                 | ...                  | ...                                 |
| 330 | 6 do             | Claud Currie ...        | do                                 | 26 June 1820         | 20 Jan. 1831                        |
|     | 9 Sept.          | George Mather ...       | do                                 | 29 do                | ...                                 |
|     | 9 do             | Charles Simson ...      | do                                 | 24 July              | ...                                 |
|     | 22 Feb. 1808     | Thomas Gillespie ...    | do                                 | ...                  | ...                                 |

| Promoted to<br>Medical<br>Board. | Retired from<br>the Service. | Died.         | Remarks.                                                                                                               |
|----------------------------------|------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------|
| ...                              | 5 May 1827                   | 24 June 1848  |                                                                                                                        |
| ...                              | ...                          | 1 Nov. 1806   |                                                                                                                        |
| ...                              | ...                          | 29 Decr. 1808 | Killed at Travancore.                                                                                                  |
| ...                              | 18 Feb. 1807                 | ...           |                                                                                                                        |
| 6 Feb. 1839                      | 31 Dec. 1848                 | 24 May 1844   | 3rd Member, 26th Feb. 1839; 2nd Member,<br>2d Feb. 1841; 1st Member, 18th Dec. 1841.                                   |
| ...                              | ...                          | 16 Nov. 1812  |                                                                                                                        |
| ...                              | 18 April 1830                | 15 April 1852 |                                                                                                                        |
| ...                              | ...                          | 20 Mar. 1838  |                                                                                                                        |
| ...                              | ...                          | 23 July 1820  |                                                                                                                        |
| ...                              | ...                          | 27 Nov. 1806  |                                                                                                                        |
| ...                              | 1 Feb. 1835                  | 20 June 1835  |                                                                                                                        |
| ...                              | 1 Sept. 1830                 | 28 Decr. 1831 |                                                                                                                        |
| ...                              | ...                          | 12 April 1818 |                                                                                                                        |
| ...                              | ...                          | 17 May 1821   |                                                                                                                        |
| ...                              | 23 Jany. 1826                | 10 April 1858 |                                                                                                                        |
| ...                              | ...                          | 3 June 1820   |                                                                                                                        |
| ...                              | ...                          | 19 May 1811   |                                                                                                                        |
| 6 Feb. 1841                      | 31 Jany. 1846                | 11 July 1852  | 3rd Member, 6th Feb. 1841; 2nd Member,<br>[18th Dec. 1841; 1st Mem., 31st Dec. 1843.<br>Cashiered, 19th December 1811. |
| ...                              | ...                          | ...           |                                                                                                                        |
| ...                              | 12 Feb. 1827                 | ...           |                                                                                                                        |
| ...                              | ...                          | 2 Mar. 1817   |                                                                                                                        |
| ...                              | 12 July 1830                 | 9 Oct. 1852   |                                                                                                                        |
| ...                              | 18 Oct. 1826                 | ...           |                                                                                                                        |
| ...                              | ...                          | 31 May 1824   |                                                                                                                        |
| ...                              | ...                          | 25 June 1820  |                                                                                                                        |
| ...                              | 27 Mar. 1832                 | 7 Jan. 1833   |                                                                                                                        |
| 3 Dec. 1841                      | 18 Dec. 1846                 | 5 April 1861  | 3rd Mem., 18th Dec. 1841; 2nd Mem., 31st,<br>[Dec. 1843; 1st Member, 31st Jan. 1846.                                   |
| 1 Dec. 1843                      | ...                          | 4 Nov. 1811   |                                                                                                                        |
| ...                              | ...                          | 19 Aug. 1846  | 3rd Member, 31st Dec. 1843; 2nd Member,<br>[31st January 1846.                                                         |
| ...                              | ...                          | 28 Nov. 1821  |                                                                                                                        |
| ...                              | ...                          | 14 Aug. 1838  |                                                                                                                        |
| ...                              | 20 May 1814                  | ...           |                                                                                                                        |
| ...                              | ...                          | 21 May 1824   |                                                                                                                        |
| ...                              | ...                          | Feb. 1818     |                                                                                                                        |
| ...                              | 10 Dec. 1833                 | ...           |                                                                                                                        |
| ...                              | ...                          | 15 Oct. 1812  |                                                                                                                        |
| ...                              | ...                          | 22 July 1824  |                                                                                                                        |
| ...                              | ...                          | 8 do 1821     |                                                                                                                        |
| ...                              | 1 Feb. 1833                  | 6 May 1845    |                                                                                                                        |
| ...                              | ...                          | 13 Sept. 1809 |                                                                                                                        |
| ...                              | ...                          | 17 Aug. 1816  |                                                                                                                        |
| ...                              | ...                          | 17 Dec. 1808  |                                                                                                                        |
| ...                              | 20 June 1820                 | ...           |                                                                                                                        |
| ...                              | ...                          | 21 Aug. 1818  |                                                                                                                        |
| Jany. 1846                       | 31 Jany. 1851                | 8 Aug. 1854   | 3rd Mem., 31st Jan. 1846; 2nd Mem., 19th<br>Aug. 1846; 1st Mem., 18th Dec. 1848.                                       |
| ...                              | ...                          | 15 Aug. 1823  |                                                                                                                        |
| ...                              | ...                          | 27 Oct. 1824  |                                                                                                                        |
| ...                              | ...                          | 12 May 1813   |                                                                                                                        |



| No. | Date of arrival. | Names.                      | Date of rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|-----------------------------|------------------------------------|----------------------|-------------------------------------|
|     | 22 Feb. 1808     | John Hastie ...             | 11 April 1808                      | 1 Aug. 1820          | ...                                 |
|     | 22 do            | John Irving, M.D. ...       | do                                 | 5 Nov.               | ...                                 |
|     | 22 do            | William E. E. Conwell       | do                                 | 11 Jan. 1821         | 11 Dec. 1835                        |
| 325 | 11 April         | Thomas Boardman ...         | do                                 | ...                  | 26 Jan. 1836                        |
|     | 8 Aug.           | David Henderson ...         | 5 July 1807                        | 18 May 1821          | ...                                 |
|     | 27 June          | David Provon ...            | do                                 | 20 June              | ...                                 |
|     | 8 Aug.           | Henry Atkinson ...          | do                                 | 9 July               | ...                                 |
|     | 8 do             | James Chalmers ...          | do                                 | ...                  | ...                                 |
| 330 | 8 do             | John Wyllie ...             | do                                 | 29 Nov. 1821         | ...                                 |
|     | 22 do            | James Shadforth ...         | do                                 | ...                  | ...                                 |
|     | 30 Sept.         | Arch. Campbell, M.D. ...    | do                                 | 6 Dec. 1821          | ...                                 |
|     | 11 April         | George Meikle ...           | do                                 | 6 Jan. 1822          | 23 Feb. 1836                        |
|     | 27 June          | Mathew Hunter ...           | do                                 | ...                  | ...                                 |
| 335 | 8 Aug.           | James Davidson ...          | 11 April 1808                      | ...                  | ...                                 |
|     | 12 Feb. 1809     | John Nixon ...              | 5 July 1807                        | ...                  | ...                                 |
|     | 12 do            | Charles Jones ...           | do                                 | 11 Oct. 1824         | ...                                 |
|     | 12 do            | Adam Napier ...             | ...                                | ...                  | ...                                 |
|     | 12 do            | John Trabeek Conran         | 5 July 1807                        | 9 Aug. 1822          | 26 Feb. 1836                        |
| 340 | 10 July          | David Donaldson ...         | 28 June 1808                       | 11 do                | ...                                 |
|     | 15 Sept.         | John Monteath ...           | do                                 | ...                  | ...                                 |
|     | 15 do            | John Harwood ...            | do                                 | 23 Jan. 1823         | ...                                 |
|     | 6 Dec.           | James Smart, M.D. ...       | do                                 | 16 Aug.              | ...                                 |
|     | 31 Aug. 1810     | John White ...              | 16 July 1809                       | 17 Sep.              | 18 May 1836                         |
| 345 | 31 do            | Sir T. Sevestre, K.T.S. ... | do                                 | 1 Jan. 1824          | 3 Sep. 1837                         |
|     | 31 do            | Alexander Rae ...           | 22 Aug. 1810                       | ...                  | ...                                 |
|     | 28 Sept.         | Norman Braid ...            | do                                 | ...                  | ...                                 |
|     | 30 July 1811     | Alexander Milne ...         | do                                 | ...                  | ...                                 |
|     | 2 Aug.           | Richard Prince ...          | do                                 | 1 May 1824           | ...                                 |
| 350 | 29 July          | Robt. Hunter Stuart.        | do                                 | ...                  | ...                                 |
|     | 29 do            | James Aitken, M.D. ...      | do                                 | 1 May 1824           | ...                                 |
|     | 2 Aug.           | William Smith ...           | do                                 | ...                  | ...                                 |
|     | 2 do             | Jonathan Gilder ...         | do                                 | ...                  | ...                                 |
|     | 2 do             | John Woolcott ...           | do                                 | ...                  | ...                                 |
| 355 | 29 July          | William Wilson, M.D. ...    | do                                 | 1 May 1824           | ...                                 |
|     | 11 Sept.         | William H. Taylor ...       | do                                 | ...                  | ...                                 |
|     | 11 do            | Robert Neilson ...          | do                                 | 1 May 1824           | ...                                 |
|     | 11 do            | John Criuckshank ...        | do                                 | 22 do                | ...                                 |
|     | 11 do            | James Mann ...              | do                                 | ...                  | ...                                 |
| 360 | 2 Nov.           | James J. Duncan ...         | do                                 | ...                  | ...                                 |
|     | 2 do             | Thomas Tomkinson ...        | do                                 | 28 May 1824          | ...                                 |
|     | 11 June 1812     | Joseph Sharman ...          | 28 July 1811                       | ...                  | ...                                 |
|     | 11 do            | Peter Scott, M. D. ...      | do                                 | ...                  | ...                                 |
|     | 9 July           | John Jones, Junior ...      | do                                 | 1 June 1824          | ...                                 |
| 365 | 2 Aug.           | David Ogilvy ...            | do                                 | ...                  | ...                                 |
|     | 2 do             | Thomas Bradbury ...         | do                                 | ...                  | ...                                 |
|     | 2 do             | David Reid ...              | do                                 | 10 Aug. 1824         | ...                                 |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                                                                                                     |
|----------------------------|---------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------|
| ...                        | ...                       | 8 Aug. 1822   |                                                                                                                              |
| ...                        | 28 Sept. 1831             | ...           |                                                                                                                              |
| ...                        | ...                       | 18 May 1836   |                                                                                                                              |
| ...                        | ...                       | 4 Dec. 1817   | Pensioned, 11th March 1814.                                                                                                  |
| ...                        | 12 Jan. 1831              | 3 Jan. 1832   |                                                                                                                              |
| ...                        | 18 Aug. 1829              | ...           |                                                                                                                              |
| ...                        | 8 Feb. 1834               | 31 Oct. 1845  |                                                                                                                              |
| ...                        | ...                       | 3 Jan. 1821   |                                                                                                                              |
| ...                        | 12 Oct. 1831              | ... 1848      |                                                                                                                              |
| ...                        | ...                       | 6 Oct. 1819   |                                                                                                                              |
| ...                        | ...                       | 1 Nov. 1833   |                                                                                                                              |
| ...                        | ...                       | 16 May 1838   |                                                                                                                              |
| ...                        | ...                       | 5 June 1813   |                                                                                                                              |
| ...                        | ...                       | 2 Jan. 1812   |                                                                                                                              |
| ...                        | ...                       | 10 May 1811   |                                                                                                                              |
| ...                        | ...                       | ...           | Placed by the sentence of a General Court Martial next below Assistant Surgeon P. Crawford, M. D. Pensioned 25th April 1829. |
| ...                        | ...                       | ...           | Transferred to the Bengal Establishment, 26th May 1809.                                                                      |
| ...                        | ...                       | 19 April 1846 |                                                                                                                              |
| ...                        | ...                       | 27 Sept. 1833 |                                                                                                                              |
| ...                        | ...                       | 4 July 1815   |                                                                                                                              |
| ...                        | ...                       | 10 Oct. 1824  |                                                                                                                              |
| ...                        | ...                       | 20 Aug. 1825  |                                                                                                                              |
| ...                        | 29 Feb. 1844              | ...           |                                                                                                                              |
| ...                        | 18 Jan. 1838              | 15 Feb. 1842  |                                                                                                                              |
| ...                        | ...                       | 5 June 1816   |                                                                                                                              |
| ...                        | ...                       | 22 July 1811  |                                                                                                                              |
| ...                        | ...                       | 24 Jan. 1813  |                                                                                                                              |
| ...                        | ...                       | 12 Mar. 1829  |                                                                                                                              |
| ...                        | ...                       | 5 Oct. 1820   |                                                                                                                              |
| ...                        | 1 April 1833              | ...           |                                                                                                                              |
| ...                        | ...                       | 16 June 1819  |                                                                                                                              |
| ...                        | ...                       | 22 July 1817  |                                                                                                                              |
| ...                        | ...                       | 10 May 1823   |                                                                                                                              |
| ...                        | ...                       | 25 Mar. 1837  |                                                                                                                              |
| ...                        | ...                       | 17 April 1813 |                                                                                                                              |
| ...                        | ...                       | 1 Oct. 1828   |                                                                                                                              |
| ...                        | 1 Feb. 1835               | ...           |                                                                                                                              |
| ...                        | ...                       | 17 June 1812  |                                                                                                                              |
| ...                        | ...                       | 11 Nov. 1821  |                                                                                                                              |
| ...                        | 21 Nov. 1836              | ...           |                                                                                                                              |
| ...                        | ...                       | 2 July 1816   |                                                                                                                              |
| ...                        | ...                       | 9 Nov. 1821   |                                                                                                                              |
| ...                        | ...                       | 16 May 1829   |                                                                                                                              |
| ...                        | ...                       | 31 Oct. 1814  |                                                                                                                              |
| ...                        | ...                       | 26 May 1813   |                                                                                                                              |
| ...                        | 15 Jan. 1836              | 2 Feb. 1845   | [ed, 12th May 1815.<br>Cashiered, 11th September 1813 - Restor-                                                              |

| No. | Date of arrival. | Names.                    | Date of rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|---------------------------|------------------------------------|----------------------|-------------------------------------|
| 370 | 17 Sept. 1812    | George Hewatson ...       | 28 July 1811                       | 23 July 1824         | ..                                  |
|     | 7 Aug.           | Edward King ...           | do                                 | ...                  | ...                                 |
|     | 7 July 1813      | Peter Crawford, M.D. ...  | do                                 | ...                  | ...                                 |
|     | 6 Sept.          | Isaac Stone ...           | 11 June 1812                       | ...                  | ...                                 |
| 375 | 10 do            | John Haines ...           | do                                 | ...                  | ...                                 |
|     | 6 do             | Richard Kellett, M.D. ... | do                                 | 28 Oct. 1824         | ...                                 |
|     | 6 do             | John Stritch, M.D. ...    | do                                 | ...                  | ...                                 |
|     | 13 Aug.          | David Boyd ...            | do                                 | 10 Nov. 1824         | 13 Jan'y. 1838                      |
| 380 | 6 Sept.          | James B. Hall ...         | do                                 | ...                  | ...                                 |
|     | 6 do             | James Stevenson ...       | do                                 | 24 May 1825          | 18 Jan'y. 1838                      |
|     | 6 do             | John Wyllie ...           | do                                 | 1 July               | 1 Feb.                              |
|     | Nov.             | James Richmond ...        | do                                 | 21 Aug.              | 27 Mar.                             |
| 385 | 4 July 1814      | William Turnbull ...      | 5 Sept. 1813                       | 24 Jan'y. 1826       | ...                                 |
|     | 4 do             | Cornelius Desormeaux ...  | do                                 | 21 Feb.              | 16 May 1838                         |
|     | 4 do             | Alexander Shedden ...     | do                                 | 17 June              | ...                                 |
|     | 4 do             | James Hazelwood ...       | do                                 | 8 Sept.              | ...                                 |
| 390 | 4 do             | W. H. Richards ...        | do                                 | do                   | ...                                 |
|     | 4 do             | Thomas Williams ...       | do                                 | 27 do                | ...                                 |
|     | 4 do             | Robert Anderson ...       | do                                 | 19 Oct.              | ...                                 |
|     | 4 do             | Robert Davidson ...       | do                                 | 22 Nov.              | 26 Feb. 1839                        |
| 395 | 4 do             | John Edwards ...          | do                                 | ...                  | ...                                 |
|     | 18 Sept.         | Alexander Campbell ...    | do                                 | 13 Feb. 1827         | ...                                 |
|     | 7 do             | Donald Smith Young ...    | do                                 | 6 May                | 18 Dec. 1841                        |
|     | 15 do            | John Dalgas ...           | do                                 | ...                  | ...                                 |
| 400 | 19 Dec. 1814     | Robert Filson, M.D. ...   | do                                 | 15 May 1827          | ...                                 |
|     | 26 do            | R. Butland Shepherd ...   | ...                                | ...                  | ...                                 |
|     | 24 Feb. 1815     | Thomas Larkin Starr ...   | ...                                | ...                  | ...                                 |
|     | 11 April         | Adam Stevenson ...        | 21 Dec. 1814                       | ...                  | ...                                 |
| 405 | 22 July          | William Baird ...         | 5 Sept. 1813                       | ...                  | ...                                 |
|     | 8 May            | William Train ...         | 25 Dec. 1814                       | 20 Jan'y. 1828       | ...                                 |
|     | 11 July          | Charles Searle ...        | 8 May 1815                         | 1 July               | ...                                 |
|     | 22 do            | Alexander Tait ...        | 5 Sept. 1814                       | ...                  | ...                                 |
| 310 | 4 Sept.          | Walter Ogilvie ...        | do                                 | ...                  | ...                                 |
|     | 24 do            | George Bucke ...          | 9 May 1815                         | 1 Oct. 1828          | ...                                 |
|     | 5 Oct.           | Thomas Bond ...           | 10 do                              | 2 do                 | ...                                 |
|     | 16 do            | James Barclay ...         | do                                 | ...                  | ...                                 |
| 310 | 7 Dec.           | John Wilson ...           | 12 May                             | 8 Oct. 1828          | ...                                 |
|     | 18 April 1816    | H. Donaldson Niven ...    | — 1815                             | ...                  | ...                                 |
|     | 16 June          | Benjamin Williams ...     | 18 April 1816                      | 16 Dec. 1828         | 1 Feb. 1845                         |
|     | 17 Sept.         | James Sibbald ...         | ...                                | ...                  | ...                                 |
| 310 | 17 July          | William Geddes ...        | 11 July 1816                       | 20 Feb. 1829         | ...                                 |
|     | 27 do            | Daniel DeLisle ...        | ...                                | ...                  | ...                                 |
|     | 26 Aug.          | S. Isaac Humfrays ...     | 27 July 1816                       | 18 Mar. 1829         | ...                                 |
|     | 13 Sept.         | C. Anthony Price ...      | 29 do                              | 26 April             | ...                                 |
| 310 | 2 Oct.           | George Jordon ...         | ...                                | ...                  | ...                                 |
|     |                  | Samuel Christy ...        | ...                                | ...                  | ...                                 |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                                                                           |
|----------------------------|---------------------------|---------------|----------------------------------------------------------------------------------------------------|
| ...                        | ...                       | 9 Aug. 1824   |                                                                                                    |
| ...                        | ...                       | 14 Aug. 1817  |                                                                                                    |
| ...                        | ...                       | 9 June 1821   |                                                                                                    |
| ...                        | ...                       | 19 do 1819    |                                                                                                    |
| ...                        | ...                       | 20 May 1822   |                                                                                                    |
| ...                        | ...                       | 16 Mar. 1835  |                                                                                                    |
| ...                        | ...                       | 6 Oct. 1821   |                                                                                                    |
| 19 Aug. 1846               | 1 Aug. 1850               | 25 do 1854    | [ber, 18th December 1846.<br>3rd Member, 19th Aug. 1846; 2nd Mem-<br>Cashiered, 11th January 1815. |
| ...                        | 18 Jan. 1841              | ...           |                                                                                                    |
| 18 Dec. 1846               | 12 Feb. 1851              | 16 June 1852  | 3rd Member, 18th December 1846; 2nd<br>Member, 1st August 1850; 1st Member,<br>31st January 1851.  |
| ...                        | 14 Jan. 1839              | 1 May 1853    |                                                                                                    |
| ...                        | 18 Nov. 1833              | ...           |                                                                                                    |
| ...                        | ...                       | 15 Feb. 1847  |                                                                                                    |
| ...                        | 1 Nov. 1831               | ...           |                                                                                                    |
| ...                        | ...                       | 12 Oct. 1834  |                                                                                                    |
| ...                        | 8 Jan. 1836               | 25 April 1856 |                                                                                                    |
| ...                        | 1 Mar. 1836               | 11 Jan. 1857  |                                                                                                    |
| ...                        | 3 Jan. 1837               | 12 Feb. 1847  |                                                                                                    |
| 1 Aug. 1850                | 31 Dec. 1852              | .....         | 3rd Member, 1st Aug. 1850; 2nd Mem-<br>ber, 31st January 1851; 1st Member,<br>12th February 1851.  |
| ...                        | ...                       | 13 Mar. 1818  |                                                                                                    |
| ...                        | ...                       | 15 Mar. 1838  |                                                                                                    |
| 31 Jan. 1851               | 13 Feb. 1851              | 5 Nov. 1852   | 3rd Member, 31st January 1851; 2nd<br>Member, 12th February 1851.                                  |
| ...                        | ..                        | 20 Jan. 1820  |                                                                                                    |
| ...                        | ..                        | 26 Sep. 1830  |                                                                                                    |
| ...                        | ...                       | 10 Feb. 1820  |                                                                                                    |
| ...                        | ...                       | 17 June 1820  |                                                                                                    |
| ...                        | ...                       | 12 Nov. 1825  |                                                                                                    |
| ...                        | ...                       | 3 Jan. 1818   |                                                                                                    |
| ...                        | ...                       | 8 Nov. 1829   |                                                                                                    |
| ...                        | 1 Mar. 1837               | ...           |                                                                                                    |
| ...                        | ...                       | 9 Sep. 1815   |                                                                                                    |
| ...                        | ...                       | 30 do 1818    |                                                                                                    |
| ...                        | 11 Jan. 1840              | 16 do 1852    |                                                                                                    |
| ...                        | ...                       | 28 July 1829  |                                                                                                    |
| ...                        | ...                       | 9 July 1816   |                                                                                                    |
| ...                        | ...                       | 16 Feb. 1832  |                                                                                                    |
| ...                        | ...                       | 26 Nov. 1817  | Killed in action at Seetabuldee near Nag-                                                          |
| ...                        | ...                       | 9 Dec. 1850   | [poor.                                                                                             |
| ...                        | ...                       | 15 July 1816  |                                                                                                    |
| ...                        | 27 April 1836             | 8 Nov. 1861   |                                                                                                    |
| ...                        | ...                       | 25 April 1823 |                                                                                                    |
| ...                        | ...                       | 1 Mar. 1831   |                                                                                                    |
| ...                        | 23 Jan. 1837              | 10 April 1852 |                                                                                                    |
| ...                        | ...                       | 30 May 1817   |                                                                                                    |
| ...                        | ...                       | 12 Nov. 1818  |                                                                                                    |

| No. | Date of arrival. | Names                     | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|---------------------------|------------------------------------|----------------------|-------------------------------------|
| 415 | 6 Nov. 1816      | Francis R. Affleck ...    | ...                                | ...                  | ...                                 |
|     | 2 Oct.           | George W. Griffith ...    | 1 Aug. 1816                        | ...                  | ...                                 |
|     | 18 Dec.          | F. E. Gristock ...        | ...                                | ...                  | ...                                 |
|     | 8 Jan. 1817      | George Knox ...           | 8 Jan. 1817                        | 17 May 1829          | 31 Dec. 1843                        |
| 420 | 10 Feb.          | Wm. Ritchie Selby ...     | ...                                | ...                  | ...                                 |
|     | 10 June          | W. M. Sutherland ...      | 10 Jan. 1817                       | ...                  | ...                                 |
|     | 26 June          | James M. Young ...        | do                                 | ...                  | ...                                 |
|     | 9 July           | James W. McCash ...       | do                                 | ...                  | ...                                 |
| 425 | 9 do             | John Lamb, M.D. ...       | 14 Jan.                            | 29 July 1829         | ...                                 |
|     | 9 do             | Alex. M. Campbell ...     | ...                                | ...                  | ...                                 |
|     | 7 Oct.           | James Smith ...           | 15 Jan. 1817                       | 14 Aug. 1829         | ...                                 |
|     | 4 Aug.           | Francis Skelton, M.D. ... | 16 do                              | ...                  | ...                                 |
| 430 | 24 Sept.         | Wm. Welliton ...          | 17 do                              | ...                  | ...                                 |
|     | 1 Oct.           | Joseph Cox ...            | 18 do                              | ...                  | ...                                 |
|     | 9 Jan. 1818      | John McDougall ...        | do                                 | ...                  | ...                                 |
|     | 23 do            | R. H. England ...         | 20 do                              | ...                  | ...                                 |
| 435 | 4 July           | William A. Hughes ...     | 13 Mar. 1818                       | 9 Nov. 1829          | ...                                 |
|     | 27 Sept.         | John Barton ...           | 15 do                              | 16 Jan. 1830         | ...                                 |
|     | 28 Aug.          | John Simm ...             | 19 April                           | 2 April              | ...                                 |
|     | 18 do            | John Morton ...           | 21 do                              | 15 do                | 29 Feb. 1844                        |
| 440 | 18 do            | Andrew Paterson ...       | do                                 | 19 do                | ...                                 |
|     | 17 Sept.         | David Brakenridge ...     | 30 May                             | 13 July              | ...                                 |
|     | 17 do            | William Hardy ...         | ...                                | ...                  | ...                                 |
|     | 12 Jan. 1819     | Peter McMillan ...        | ...                                | ...                  | ...                                 |
| 445 | 7 June           | Gerrard A. Herklots ...   | 18 July 1818                       | 2 Sept. 1830         | ...                                 |
|     | 6 March          | Archibald Ewart ...       | 6 Aug.                             | ...                  | ...                                 |
|     | 7 June           | Thomas Edwards ...        | 1 Oct.                             | ...                  | ...                                 |
|     | 26 May           | Ebenezer W. McCosh ...    | 6 do                               | ...                  | ...                                 |
| 450 | 9 do             | Geo. Hamilton Bell ...    | 1 Decr.                            | ...                  | ...                                 |
|     | 18 June          | Nicholas A. Woods ...     | 5 Feby. 1819                       | 27 Sept. 1830        | ...                                 |
|     | 12 do            | Andrew Hewat ...          | 6 do                               | ...                  | ...                                 |
|     | 5 Aug.           | George Wilson ...         | 17 April                           | ...                  | ...                                 |
| 455 | 21 do            | William Faaken ...        | 18 do                              | 13 Jan. 1831         | ...                                 |
|     | 16 Sept.         | George B. McDonell ...    | 25 May                             | 3 Feby.              | 27 Feb. 1846                        |
|     | 16 do            | Robert Wight, M.D. ...    | do                                 | 22 do                | ...                                 |
|     | 8 Oct.           | Edward Chapman ...        | 29 do                              | 2 Mar.               | ...                                 |
| 460 | 22 do            | Thomas Kirk ...           | 11 June                            | ...                  | ...                                 |
|     | 22 do            | George Rose ...           | do                                 | ...                  | ...                                 |
|     | 22 do            | Jonathan Sandford ...     | do                                 | 18 June 1831         | ...                                 |
|     | 22 do            | James McGeorge ...        | do                                 | ...                  | ...                                 |
| 465 | 23 Dec.          | William Bannister ...     | 9 July                             | 28 Sept. 1831        | ...                                 |
|     | 30 May 1820      | John Kilman ...           | 31 Decr.                           | ...                  | ...                                 |
|     | 18 June          | John Malcolm ...          | 24 Feby. 1820                      | ...                  | ...                                 |
|     | 29 do            | James Stewart ...         | ...                                | ...                  | ...                                 |
| 470 | 29 do            | John Adam ...             | 1 Mar. 1820                        | 18 Oct. 1831         | ...                                 |
|     | 7 July           | George Hyne ...           | 4 do                               | ...                  | ...                                 |
|     | 7 do             | H. F. G. Davenport ...    | do                                 | ...                  | ...                                 |
|     | 7 do             | William Cockrane ...      | do                                 | ...                  | ...                                 |
| 475 | 29 do            | Joseph G. Rumbold ...     | do                                 | ...                  | ...                                 |
|     | 31 do            | James Dalmahoy ...        | 7 April                            | 2 Nov. 1831          | ...                                 |
|     | 9 Oct.           | Hope S. Fleming ...       | 12 do                              | 24 do                | ...                                 |

| Promoted to<br>Medical<br>Board. | Retired from<br>the Service. | Died.         | Remarks.                           |
|----------------------------------|------------------------------|---------------|------------------------------------|
| —                                | ...                          | 12 Sept. 1821 |                                    |
| —                                | 5 Dec. 1827                  | ...           |                                    |
| ...                              | ...                          | 16 Octr. 1820 |                                    |
| ...                              | ...                          | 2 Sept. 1847  |                                    |
| ...                              | ...                          | 18 June 1822  |                                    |
| ...                              | ...                          | 2 July 1826   |                                    |
| ...                              | ...                          | 5 Febr. 1820  |                                    |
| ...                              | ...                          | 25 June 1819  |                                    |
| ...                              | 23 Feb. 1837                 | 31 July 1854  |                                    |
| ...                              | ...                          | 5 June 1820   |                                    |
| ...                              | ...                          | 27 Jany. 1844 |                                    |
| ...                              | ...                          | ...           | Resigned in Europe, 18th May 1822. |
| ...                              | ...                          | 27 Aug. 1829  |                                    |
| ...                              | ...                          | 6 Octr. 1827  |                                    |
| ...                              | ...                          | 5 April 1821  |                                    |
| ...                              | ...                          | 27 May 1824   |                                    |
| ...                              | 31 Decr. 1841                | 15 Feby. 1845 |                                    |
| ...                              | ...                          | 2 do 1831     |                                    |
| ...                              | 25 Mar. 1839                 | ...           |                                    |
| ...                              | 28 Feb. 1847                 | ...           |                                    |
| ...                              | ...                          | 13 Sept. 1834 |                                    |
| ...                              | 1 Feb. 1837                  | ...           |                                    |
| ...                              | ...                          | 7 June 1820   |                                    |
| ...                              | ...                          | 2 April 1822  |                                    |
| ...                              | ...                          | 8 Jany. 1834  |                                    |
| ...                              | ...                          | 23 Decr. 1825 |                                    |
| ...                              | ...                          | 14 May 1826   |                                    |
| ...                              | ...                          | 5 June 1824   |                                    |
| ...                              | 26 Nov. 1829                 | ...           |                                    |
| ...                              | 28 Feb. 1841                 | 9 Octr. 1842  |                                    |
| ...                              | ...                          | ...           | Struck off, 23rd April 1824.       |
| ...                              | ...                          | 13 Octr. 1825 |                                    |
| ...                              | ...                          | 3 do 1836     |                                    |
| ...                              | 28 Feb. 1850                 | 10 April 1850 |                                    |
| ...                              | 28 do 1853                   | ...           |                                    |
| ...                              | 23 Nov. 1831                 | ...           |                                    |
| ...                              | ...                          | 3 May 1820    |                                    |
| ...                              | 4 July 1829                  | ...           |                                    |
| ...                              | 15 Sept. 1833                | ...           |                                    |
| ...                              | ...                          | 2 Nov. 1821   |                                    |
| ...                              | ...                          | 18 July 1839  |                                    |
| ...                              | ...                          | 21 Octr. 1830 |                                    |
| ...                              | ...                          | 30 June 1824  |                                    |
| ...                              | ...                          | 5 June 1821   |                                    |
| ...                              | 20 July 1836                 | ...           |                                    |
| ...                              | ...                          | 4 April 1826  |                                    |
| ...                              | ...                          | 23 July 1829  |                                    |
| ...                              | ...                          | 13 Jany. 1829 |                                    |
| ...                              | ...                          | 7 April 1821  |                                    |
| ...                              | 20 July 1840                 | ...           |                                    |
| ...                              | 5 Jany. 1846                 | ...           |                                    |

| No. | Date of Arrival. | Names.                  | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|-------------------------|------------------------------------|----------------------|-------------------------------------|
| 465 | 3 Sept. 1820     | John W. Sherman ...     | 17 April 1820                      | 17 Feb. 1832         | 6 Oct. 1846                         |
|     | 17 do            | Thomas W. Thomas...     | do                                 | ...                  | ...                                 |
|     | 6 do             | William Kerr Hay ...    | 20 May                             | 28 Mar. 1832         | 16 Oct. 1846                        |
|     | 25 do            | Samuel Stokes ...       | 3 June                             | 1 Jan. 1833          | ...                                 |
|     | 16 Oct.          | David Loudon ...        | April                              | ...                  | ...                                 |
| 470 | 16 do            | Edward Milner ...       | do                                 | ...                  | ...                                 |
|     | ...              | Robert Greig, M. D...   | June                               | ...                  | ...                                 |
|     | 13 Febr. 1821    | Charles May ...         | 24 Sept.                           | ...                  | ...                                 |
|     | 26 March         | William Bruce Jack...   | 9 Oct.                             | ...                  | ...                                 |
|     | 19 May           | Joseph Law ...          | 22 Dec.                            | ...                  | ...                                 |
| 475 | 14 June          | James Shuter, M. D...   | 21 Feb. 1821                       | ...                  | ...                                 |
|     | 14 do            | John B. Alexander ...   | 21 do                              | ...                  | ...                                 |
|     | 20 do            | Thomas Keys ...         | 27 do                              | ...                  | ...                                 |
|     | 20 do            | George Gleig ...        | 27 do                              | ...                  | ...                                 |
|     | 15 Sept.         | John Caswall ...        | 21 March                           | ...                  | ...                                 |
| 480 | ...              | Michael John Short..    | 30 do                              | ...                  | ...                                 |
|     | 5 Sept.          | Samuel Higginson ...    | 5 May                              | 15 Jan. 1833         | ...                                 |
|     | 5 do             | R. Charles Evans ...    | do                                 | ...                  | ...                                 |
|     | 9 do             | Francis Godfrey ...     | 17 do                              | 2 Feb. 1833          | 18 Dec. 1846                        |
|     | 16 do            | James G. Coleman ...    | 19 do                              | 2 April              | 15 Feb. 1847                        |
| 985 | 16 do            | John Brown ...          | 19 do                              | 13 Aug.              | ...                                 |
|     | 9 Nov.           | James Daly ...          | 31 do                              | ...                  | ...                                 |
|     | 14 do            | William Mortimer ...    | 11 June                            | 14 Aug. 1833         | ...                                 |
|     | ...              | Robert Scott ...        | 24 Aug.                            | 15 Sept.             | 5 Mar. 1847                         |
|     | 5 March 1822     | James B. Preston ...    | 29 Sept.                           | 27 Sept.             | 2 Sept.                             |
| 490 | ...              | Michael Blood ...       | ...                                | ...                  | ...                                 |
|     | 5 March          | William Niven ...       | ...                                | ...                  | ...                                 |
|     | 5 May            | William R. Smyth ...    | 27 Nov. 1821                       | 28 Sept. 1833        | 2 Nov. 1847                         |
|     | 8 do             | John Cockron, M. D ...  | 9 Dec.                             | ...                  | ...                                 |
|     | 6 July           | James Laraine Geddes    | 14 Jan. 1822                       | 1 Nov. 1833          | 28 Feb. 1850                        |
| 495 | 14 June          | Thomas Moore Lane..     | 19 do                              | 18 do                | ...                                 |
|     | 14 do            | Benjamin G. Maurice     | 19 do                              | 10 Dec.              | ...                                 |
|     | 14 do            | William F. Reeks ...    | 19 do                              | ...                  | ...                                 |
|     | 15 July          | James Farris ...        | 17 Mar.                            | ...                  | ...                                 |
|     | 15 do            | Robert Rolland ...      | 17 do                              | ...                  | ...                                 |
| 500 | 21 Aug.          | Edward Jessop, M.D...   | 30 do                              | ...                  | ...                                 |
|     | 6 Sept.          | Alex. T. Christie, M.D. | 2 April                            | ...                  | ...                                 |
|     | 6 do             | John Macfarlane.....    | 2 do                               | 18 Jan. 1834.        | ...                                 |
|     | 6 do             | James Traill...         | 2 do                               | ...                  | ...                                 |
|     | 6 do             | Thomas Stewart ...      | 2 do                               | ...                  | ...                                 |
| 505 | 6 do             | Robert Baikie, M. D...  | 2 do                               | 8 Feb. 1834          | ...                                 |
|     | 20 Aug.          | Samuel Wm. Lister..     | 20 do                              | ...                  | ...                                 |
|     | 4 Sept.          | Andrew N. Magrath.      | 10 May                             | 30 May 1834          | 31 Jan. 1851                        |
|     | 4 do             | Francis Pulham ...      | 10 do                              | ...                  | ...                                 |
|     | 26 Aug.          | David Falconer...       | 13 do                              | 13 Sep. 1834         | 31 Dec. 1848                        |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                                                                                                       |
|----------------------------|---------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------|
| 12 Feb. 1851               | 12 Feb. 1856              | ...           | 3rd Memr., 12th Feb. 1851; 2nd Memr., 13th Feb. 1851; 1st Memr., 31st Dec. 1852.                                               |
| ...                        | ...                       | 8 June 1823   |                                                                                                                                |
| 13 Feb. 1851               | 14 Feb. 1854              | ...           | 3rd Member, 13th February 1851, 2nd [Member, 31st December, 1852.                                                              |
| ...                        | ...                       | 12 Nov. 1843  |                                                                                                                                |
| ...                        | ...                       | 28 May 1821   |                                                                                                                                |
| ...                        | ...                       | 9 June 1821   |                                                                                                                                |
| ...                        | ...                       | 15 Nov. 1823  |                                                                                                                                |
| ...                        | ...                       | 30 June 1824  |                                                                                                                                |
| ...                        | ...                       | 1822          |                                                                                                                                |
| ...                        | ...                       | ...           | Pensioned in Europe by the Honorable Court of Directors. Removed from the effective List, vide G. O. 2nd August 1831, No. 201. |
| ...                        | ...                       | 12 Oct. 1826  |                                                                                                                                |
| ...                        | ...                       | 28 April 1827 |                                                                                                                                |
| ...                        | ...                       | 25 Mar. 1825  |                                                                                                                                |
| ...                        | ...                       | 6 April 1827  |                                                                                                                                |
| ...                        | ...                       | ...           | Struck off the list from 28th Dec. 1830. Not Admitted.                                                                         |
| ...                        | ...                       | 12 Octr. 1838 |                                                                                                                                |
| ...                        | ...                       | 20 May 1822   | [Member, 14th February 1854.                                                                                                   |
| 31 Dec. 1852               | 1 Jany. 1855              | ...           | 3rd Member, 31st December 1852; 2nd                                                                                            |
| ...                        | 2 Mar. 1847               | ...           |                                                                                                                                |
| ...                        | 1 Mar. 1842               | ...           |                                                                                                                                |
| ...                        | ...                       | ...           | Resigned in Europe, 21st October 1824.                                                                                         |
| ...                        | 3 Jany. 1843              | 16 May 1848   |                                                                                                                                |
| ...                        | 15 Dec. 1853              | ...           |                                                                                                                                |
| 14 Feb. 1854               | ...                       | 28 June 1858  | 3rd Memr., 14th Feb. 1854; 2nd Memr., 1st Jany. 1855, 1st Memr., 12th Feb. 1856. Not arrived.                                  |
| ...                        | ...                       | ...           |                                                                                                                                |
| ...                        | ...                       | 4 Oct. 1822   |                                                                                                                                |
| ...                        | 15 Feb. 1851              | 5 July 1862   |                                                                                                                                |
| ...                        | ...                       | 19 June 1825  |                                                                                                                                |
| 1 Jany. 1855               | 1 Jany. 1860              | ...           | 3rd Member, 1st January 1855; 2nd Mem- [ber, 21st February 1856.                                                               |
| ...                        | ...                       | 26 Sept. 1844 |                                                                                                                                |
| ...                        | 2 Feb. 1841               | 17 Jany. do   |                                                                                                                                |
| ...                        | ...                       | 22 Dec. 1825  |                                                                                                                                |
| ...                        | ...                       | 17 Sept. 1822 |                                                                                                                                |
| ...                        | ...                       | ...           | Resigned in Europe, 14th January 1826.                                                                                         |
| ...                        | ...                       | 8 Dec. 1829   |                                                                                                                                |
| ...                        | ...                       | 3 Nov. 1832   |                                                                                                                                |
| ...                        | 23 Dec. 1843              | 15 Nov. 1846  |                                                                                                                                |
| ...                        | ...                       | 15 May 1829   |                                                                                                                                |
| ...                        | ...                       | 7 June 1828   |                                                                                                                                |
| ...                        | 31 July 1844              | ...           |                                                                                                                                |
| ...                        | ...                       | 18 Sept. 1833 |                                                                                                                                |
| 12 Feb. 1856               | ...                       | 27 Dec. 1860  | 3rd Member, 12th Feb. 1856. Director Genl. of the Medl. Dept., 1st Jany. 1858.                                                 |
| ...                        | ...                       | 17 Jany. 1828 |                                                                                                                                |
| ...                        | 21 Feb. 1855              | 8 Nov. 1857   |                                                                                                                                |



| Nos. | Date of arrival. | Names.                     | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|----------------------------|------------------------------------|----------------------|-------------------------------------|
| 510  | 26 Aug. 1822     | Alexander Stuart ...       | 13 May 1822                        | 12 Oct. 1834         | ...                                 |
|      | 23 Sept.         | Mungo Park, M. D. ...      | 14 do                              | ...                  | ...                                 |
|      | ...              | Mathew Mendes ...          | ...                                | ...                  | ...                                 |
|      | 13 Dec.          | Edward Tracy ...           | 31 May 1822                        | ...                  | ...                                 |
|      | 13 do            | Anthony E. Blest ...       | 31 do                              | 1 Feb. 1835          | ...                                 |
| 515  | 18 Jan. 1823     | James Lawder ...           | 13 July                            | 1 do                 | ...                                 |
|      | 14 do            | Robert Sutherland ...      | 18 Aug.                            | 16 Mar.              | 13 Aug. 1850                        |
|      | 14 do            | Charles C. Johnson ...     | 18 do                              | ...                  | ...                                 |
|      | 14 do            | George Lockhart, A.M. ...  | 18 do                              | ...                  | ...                                 |
|      | 12 April         | John Ricks, M. D. ...      | 6 Oct.                             | 27 April 1835        | ...                                 |
| 520  | 8 March          | James R. Gibb, M. D. ...   | 11 do                              | ...                  | ...                                 |
|      | 8 do             | John Dunn ...              | 11 do                              | ...                  | ...                                 |
|      | 23 June          | Daniel Archer, M. D. ...   | 22 Jan. 1823                       | ...                  | ...                                 |
|      | 7 Sept.          | Robert Power ...           | 4 Feb.                             | ...                  | ...                                 |
|      | 7 do             | Thomas Ward, M. D. ...     | 4 do                               | ...                  | ...                                 |
| 525  | 20 July          | Thomas Powell ...          | 16 do                              | ...                  | ...                                 |
|      | 7 June           | Tindall Thornton, M.D. ... | 26 do                              | ...                  | ...                                 |
|      | 7 do             | Jas. Colquhoun, M.D. ...   | 26 do                              | 8 Jan. 1836          | ...                                 |
|      | 7 do             | George Hopkins, M.D. ...   | 26 do                              | 15 do                | ...                                 |
|      | 13 Aug.          | George A. C. Bright ...    | 12 April                           | 22 Feb.              | ...                                 |
| 530  | 3 Sept.          | Joseph Thomson ...         | 24 do                              | 22 do                | ...                                 |
|      | 13 Oct.          | Joseph Bainbridge ...      | 3 May                              | ...                  | ...                                 |
|      | 25 Sept.         | Robert Oliphant ...        | 8 do                               | 1 Mar. 1836          | ...                                 |
|      | 25 do            | John Peter Grant ...       | 8 do                               | 18 May               | ...                                 |
|      | 3 do             | David Richardson ...       | 9 do                               | 20 July              | ...                                 |
| 535  | 3 do             | John G. Malcolmson ...     | 9 do                               | 3 Oct.               | ...                                 |
|      | 5 Nov.           | Eugene Finnelly, M.D. ...  | ...                                | ...                  | ...                                 |
|      | ...              | (now Hussey)               | 15 June                            | 3 Jan. 1837          | ...                                 |
|      | ...              | George Taylor ...          | 25 do                              | ...                  | ...                                 |
|      | 5 Feb. 1824      | James Bell ...             | 19 Aug.                            | 28 Jan. 1837         | ...                                 |
|      | 23 Aug. 1823     | Thomas Key ...             | 23 do                              | 1 Feb.               | 12 Feb. 1851                        |
| 540  | 17 April 1824    | Geo. V. Cumming ...        | 19 Oct.                            | 23 do                | 13 do                               |
|      | 25 June          | William Davies ...         | 18 Nov.                            | ...                  | ...                                 |
|      | 14 May           | Duncan Vertue ...          | 14 Dec.                            | 1 Mar. 1837          | ...                                 |
|      | 6 July           | George Pearse, M. D. ...   | 10 Feb. 1824                       | 25 do                | 13 Feb. 1851                        |
|      | 19 do            | Raymont Lindsell ...       | 18 do                              | ...                  | ...                                 |
| 545  | 19 do            | George Beetsen ...         | 19 do                              | 29 April 1837        | 13 Feb. 1851                        |
|      | 2 do             | De Burgh Birch, M.D. ...   | 29 do                              | 3 July               | ...                                 |
|      | 24 June 1826     | John Mack ...              | 18 do                              | ...                  | ...                                 |
|      | ...              | Robert Nimmo ...           | ...                                | ...                  | ...                                 |
|      | 25 Nov. 1825     | C. Jameson ...             | 29 Feb. 1824                       | 13 Jan. 1838         | ...                                 |
| 550  | 28 July 1824     | Alex. F. McLachlan ...     | 29 Mar.                            | ...                  | ...                                 |
|      | 4 July 1825      | Geo. Wm. Scheniman ...     | 21 Oct.                            | 18 Jan. 1838         | ...                                 |
|      | 6 May            | Thomas Taplin ...          | 4 Dec.                             | 15 Mar.              | ...                                 |
|      | 8 do             | Duncan Munro ...           | 11 do                              | 20 do                | ...                                 |
|      | 8 do             | William Browne ...         | 11 do                              | ...                  | ...                                 |
| 555  | 3 July           | Alexander Warrand ...      | 12 Feb. 1825                       | ...                  | ...                                 |
|      | 20 June          | Patrick Miller, M. D. ...  | 25 do                              | ...                  | ...                                 |
|      | 4 July           | Wm. Gowdie Owen ...        | 20 Mar.                            | ...                  | ...                                 |
|      | 2 Sept.          | Quintin Jamieson ...       | 14 May                             | 16 May 1838          | ...                                 |
|      | 2 do             | John T. Maule ...          | 14 do                              | 25 do                | 26 Feb. 1851                        |

| Promoted to<br>Medical<br>Board. | Retired from<br>the Service. | Died.         | Remarks.                                                  |
|----------------------------------|------------------------------|---------------|-----------------------------------------------------------|
| ...                              | 29 April 1837                | ...           |                                                           |
| ...                              | ...                          | 20 Jany. 1823 |                                                           |
| ...                              | ...                          | 9 July 1828   | Never joined; died in Europe.                             |
| ...                              | ...                          | 2 Octr. 1834  |                                                           |
| ...                              | 28 Feb. 1847                 | ...           |                                                           |
| ...                              | 29 do 1848                   | 21 Feb. 1860  |                                                           |
| ...                              | 3 Aug. 1852                  | ...           |                                                           |
| ...                              | ...                          | 5 Jany. 1832  |                                                           |
| ...                              | ...                          | 6 June 1831   |                                                           |
| ...                              | ...                          | 10 Decr. 1841 |                                                           |
| ...                              | ...                          | 2 Novr. 1831  |                                                           |
| ...                              | ...                          | 3 Jany. 1824  |                                                           |
| ...                              | ...                          | 8 Sept. 1831  |                                                           |
| ...                              | ...                          | 16 Octr. 1835 | [1836<br>Died at sea. Promotion cancelled in June         |
| ...                              | ...                          | 23 June 1833  |                                                           |
| ...                              | 15 Nov. 1832                 | ...           |                                                           |
| ...                              | ...                          | 12 Febr. 1829 |                                                           |
| ...                              | 15 Jany. 1849                | 27 Jany. 1862 |                                                           |
| ...                              | ...                          | 8 July 1842   |                                                           |
| ...                              | ...                          | 24 Mar. 1851  |                                                           |
| ...                              | ...                          | 8 July 1837   | Resigned, 10th May 1825.                                  |
| ...                              | ...                          | 15 Aug. 1843  |                                                           |
| ...                              | ...                          | 22 Apr. 1844  |                                                           |
| ...                              | ...                          | 31 Jany. 1846 |                                                           |
| ...                              | 25 May 1838                  | ...           |                                                           |
| ...                              | 12 Jany. 1847                | 25 May 1863   |                                                           |
| ...                              | ...                          | 12 Sept. 1824 | Never joined; died at Bombay.                             |
| ...                              | ...                          | 24 July 1839  |                                                           |
| ...                              | 24 Feb. 1854                 | ...           |                                                           |
| ...                              | ...                          | 1 Octr. 1856  |                                                           |
| ...                              | ...                          | 28 Aug. 1824  |                                                           |
| ...                              | 1 Sept. 1841                 | ...           |                                                           |
| ...                              | 28 April 1861                | ...           | Director General, Medical Department,<br>[11th July 1859. |
| ...                              | ...                          | 7 Decr. 1826  |                                                           |
| ...                              | 25 Oct. 1859                 | ...           |                                                           |
| ...                              | 31 Aug. 1849                 | ...           |                                                           |
| ...                              | ...                          | 20 May 1832   |                                                           |
| ...                              | ...                          | ...           | Never joined; struck off, 13th August 1830.               |
| ...                              | ...                          | 30 June 1839  |                                                           |
| ...                              | ...                          | 28 June 1825  |                                                           |
| ...                              | ...                          | 7 Aug. 1846   |                                                           |
| ...                              | 31 Aug. 1849                 | ...           |                                                           |
| ...                              | ...                          | 24 Sept. 1840 |                                                           |
| ...                              | ...                          | 30 Nov. 1828  |                                                           |
| ...                              | ...                          | 1 July 1835   |                                                           |
| ...                              | ...                          | 6 Sept. 1826  |                                                           |
| ...                              | ...                          | 24 April 1827 |                                                           |
| ...                              | 10 June 1845                 | ...           |                                                           |
| ...                              | ...                          | ...           |                                                           |

| Nos. | Date of arrival. | Names.                    | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|---------------------------|------------------------------------|----------------------|-------------------------------------|
| 560  | 11 June 1826     | Wm. G. Maxwell ...        | 28 Dec. 1825                       | 12 Oct. 1838         | 26 Oct. 1852                        |
|      | 12 July          | William Poole ...         | 15 Feb. 1826                       | 14 Jan. 1839         | ...                                 |
|      | ...              | Geo. Carr, M. D. ...      | 16 do                              | ...                  | ...                                 |
|      | 20 Aug. 1826     | William Butler ...        | 2 Mar.                             | 26 Feb. 1839         | 24 Feb. 1854                        |
|      | 20 do            | Augustus Millengen. ...   | 2 do                               | ...                  | ...                                 |
| 565  | 24 June          | M. Baillie Pollock ...    | 8 Mar.                             | 25 Mar. 1839         | ...                                 |
|      | 31 Aug.          | John Ladd ...             | 15 May                             | 30 June              | ...                                 |
|      | 7 Nov.           | Philip Poole ...          | 26 June                            | ...                  | ...                                 |
|      | 10 Jan. 1827     | Henry Smith Brice... ..   | 9 Sept.                            | 18 July 1839         | ...                                 |
|      | 4 Mar.           | William Woollett ...      | 16 do                              | ...                  | ...                                 |
| 570  | 4 do             | Septimus Chippindall ...  | 16 do                              | ...                  | ...                                 |
|      | 23 do            | Thomas Grigg ...          | 14 Nov.                            | 24 July 1839         | ...                                 |
|      | 2 May            | Joseph Lawrance ...       | 19 do                              | 11 Jan. 1840         | ...                                 |
|      | 2 do             | Duncan Macdougall. ...    | 19 do                              | ...                  | ...                                 |
|      | 27 Jan. 1826     | George Thomson ...        | 15 Dec.                            | 20 July 1840         | ...                                 |
| 575  | 1 June 1827      | Charles Wilkinson ...     | 5 Jan. 1827                        | ...                  | ...                                 |
|      | 26 Aug.          | N. F. Clarkson, V. S. ... | 8 Feb.                             | ...                  | ...                                 |
|      | 23 June          | G. Chester, V. S. ...     | 27 do                              | ...                  | ...                                 |
|      | 19 Sept.         | Robert Cole ...           | 8 May                              | 24 Sept. 1840        | 14 Feb. 1854                        |
|      | 23 Aug.          | H. C. Ludlow, M. D. ...   | 13 do                              | 4 Nov.               | ...                                 |
| 580  | 31 Oct.          | Joseph Wilkinson ...      | 22 do                              | 18 Jan. 1841         | ...                                 |
|      | 30 Sept.         | Henry Gibbon Graham ...   | 3 June                             | 2 Feb.               | 8 June 1855                         |
|      | 17 Oct.          | John Richmond ...         | 14 do                              | 2 do                 | 5 Jan.                              |
|      | 17 do            | Thomas O'Neill ...        | 14 do                              | 28 do                | ...                                 |
|      | 10 Feby. 1828    | George Harding ...        | 2 Aug.                             | 1 Sept.              | ...                                 |
| 585  | 30 Nov. 1827     | T. Leman Mathews ...      | 4 do                               | 10 Dec.              | ...                                 |
|      | 30 do            | Frederick Cooper ...      | 4 do                               | 17 do                | 12 Feb. 1856                        |
|      | 30 do            | J. Western, V. S. ...     | 4 do                               | ...                  | ...                                 |
|      | 11 Jan. 1828     | William Burrell ...       | 28 do                              | 31 Dec. 1841         | 15 April 1856                       |
|      | 7 do             | William Lloyd ...         | 9 Sept.                            | ...                  | ...                                 |
| 590  | 14 March         | Walter Laurie, M.D. ...   | 13 Oct.                            | 1 Mar. 1842          | ...                                 |
|      | 19 Feby.         | Samuel Brooking ...       | 31 do                              | 8 July               | ...                                 |
|      | 27 do            | John Smith Owen ...       | 4 Nov.                             | ...                  | ...                                 |
|      | 3 June           | Samuel Rogers ...         | 12 Dec.                            | 3 Jan. 1843          | ...                                 |
|      | 19 May           | Henry H. P. Major ...     | 25 do                              | ...                  | ...                                 |
| 595  | 19 do            | J. F. Jennings, V. S. ... | 25 do                              | ...                  | ...                                 |
|      | 13 June          | Solomon H. Royes ...      | 1 Jan. 1828                        | ...                  | ...                                 |
|      | 25 do            | H. Hooper, V. S. ...      | 3 do                               | ...                  | ...                                 |
|      | 27 May           | S. A. George Young ...    | 10 do                              | 15 Aug. 1843         | ...                                 |
|      | 18 Aug.          | James Eaton, M.D., ...    | 16 April                           | 12 Nov.              | ...                                 |
| 600  | 15 Sept.         | Thomas Hagger, V. S. ...  | 1 May                              | ...                  | ...                                 |
|      | 19 do            | William Shedden ...       | 2 do                               | ...                  | ...                                 |
|      | 10 do            | Edmund Walter Eyre ...    | 10 do                              | 28 Dec. 1843         | 1 Oct. 1856                         |
|      | 22 do            | Octavius Palmer ...       | 20 do                              | ...                  | ...                                 |
|      | 22 do            | John McKenna ...          | 20 May                             | 31 Dec. 1843         | 8 Aug. 1857                         |
| 605  | 23 Nov.          | John Rowland ...          | 18 June                            | ...                  | ...                                 |
|      | 23 do            | Frederick B. Stapp ...    | 13 do                              | ...                  | ...                                 |
|      | 14 Dec.          | Jonathan Flockton ...     | 27 do                              | ...                  | ...                                 |
|      | 17 Jan. 1829     | George Lubbren ...        | 30 Aug.                            | ...                  | ...                                 |
|      | 23 do            | Edwin Vincent, V. S. ...  | 30 do                              | ...                  | ...                                 |
| 610  | 14 Feb.          | George T. Bayfield ...    | 20 Sept.                           | ...                  | ...                                 |

| Promoted to<br>Medical<br>Board. | Retired from<br>the Service. | Died.         | Remarks.                                                                |
|----------------------------------|------------------------------|---------------|-------------------------------------------------------------------------|
| ...                              | 1 July 1858                  | ...           | Never joined; struck off the Service, vide<br>[G. O. 22nd August 1828.] |
| ...                              | 31 Jany. 1850                | ...           |                                                                         |
| ...                              | ...                          | ...           |                                                                         |
| ...                              | ...                          | 30 Mar. 1856  |                                                                         |
| ...                              | 2 June 1831                  | ...           |                                                                         |
| ...                              | ...                          | 7 July 1844   |                                                                         |
| ...                              | 30 Sept. 1849                | 10 June 1850  |                                                                         |
| ...                              | ...                          | 26 May 1836   |                                                                         |
| ...                              | 20 Sept. 1849                | ...           |                                                                         |
| ...                              | ...                          | 23 June 1835  |                                                                         |
| ...                              | ...                          | 14 Feb. 1839  | Principal Inspr. General, Medical Depart-<br>[ment, 23rd April 1861.]   |
| ...                              | ...                          | 3 June 1845   |                                                                         |
| ...                              | 30 Sept. 1849                | ...           |                                                                         |
| ...                              | ...                          | 19 Dec. 1836  |                                                                         |
| ...                              | 28 Feb. 1845                 | ...           |                                                                         |
| ...                              | ...                          | 28 June 1829  |                                                                         |
| ...                              | 12 July 1848                 | 6 Sept. 1848  |                                                                         |
| ...                              | 28 Feb. 1846                 | 21 Aug. 1861  |                                                                         |
| ...                              | ...                          | ...           |                                                                         |
| ...                              | 2 Jany. 1850                 | 21 April 1862 |                                                                         |
| ...                              | 1 do 1854                    | 22 Dec. 1857  | Dismissed, 14th August 1847.                                            |
| ...                              | 20 Nov. 1862                 | ...           |                                                                         |
| ...                              | ...                          | 8 Aug. 1857   |                                                                         |
| ...                              | 21 Nov. 1853                 | 5 July 1862   |                                                                         |
| ...                              | 9 Jany. 1850                 | 16 Oct. 1856  |                                                                         |
| ...                              | 1 do 1849                    | 23 July 1861  |                                                                         |
| ...                              | ...                          | ...           |                                                                         |
| ...                              | 18 Feb. 1858                 | 23 July 1859  |                                                                         |
| ...                              | 1 Jany. 1859                 | ...           |                                                                         |
| ...                              | 29 Feb. 1832                 | ...           |                                                                         |
| ...                              | ...                          | 24 April 1844 | Dismissed, 14th August 1847.                                            |
| ...                              | 1 July 1846                  | ...           |                                                                         |
| ...                              | 17 do 1840                   | ...           |                                                                         |
| ...                              | 3 Sept. 1848                 | 21 Mar. 1860  |                                                                         |
| ...                              | 7 April 1830                 | ...           |                                                                         |
| ...                              | 20 July 1845                 | ...           |                                                                         |
| ...                              | ...                          | 11 Jany. 1837 |                                                                         |
| ...                              | 20 July 1846                 | ...           |                                                                         |
| ...                              | 18 Feb. 1855                 | ...           |                                                                         |
| ...                              | 14 Oct. 1848                 | ...           |                                                                         |
| ...                              | 28 Feb. 1853                 | 14 Nov. 1853  | Dismissed, 14th August 1847.                                            |
| ...                              | ...                          | 25 Feb. 1841  |                                                                         |
| ...                              | 28 Feb. 1861                 | ...           |                                                                         |
| ...                              | ...                          | 15 Mar. 1841  |                                                                         |
| ...                              | 10 Oct. 1863                 | ...           |                                                                         |
| ...                              | ...                          | 6 June 1829   |                                                                         |
| ...                              | ...                          | ...           |                                                                         |
| ...                              | ...                          | 19 Oct. 1842  |                                                                         |
| ...                              | ...                          | 6 May 1834    |                                                                         |
| ...                              | ...                          | ...           |                                                                         |
| ...                              | ...                          | Sept. 1840    |                                                                         |

| Not. | Date of arrival. | Names.                 | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|------------------------|------------------------------------|----------------------|-------------------------------------|
| 615  | 1 Feb. 1829      | C. H. Auchinleck, M.D. | 25 Sept. 1828                      | ...                  | ...                                 |
|      | 1 do             | David Kenny            | 25 do                              | ..                   | ...                                 |
|      | 14 May           | John J. Jeffreys       | 19 Nov.                            | ...                  | ...                                 |
|      | 21 April         | John O'Neill, M.D.     | 5 Dec.                             | ...                  | ...                                 |
|      | 7 June           | Amos G. Rowlands       | 28 do                              | ...                  | ...                                 |
| 620  | 16 May           | Buchan W. Wright       | 1 Jan. 1829                        | ...                  | ...                                 |
|      | ...              | Robert Russell         | 6 do                               | ...                  | ...                                 |
|      | 16 June 1829     | James Innes, A.M.      | 20 do                              | 27 Jan. 1844         | ...                                 |
|      | 9 Sept.          | John Bell              | 17 Feb.                            | ...                  | ...                                 |
|      | 10 Aug.          | Dugald F. Macleod      | 5 Mar.                             | ...                  | ...                                 |
| 625  | 10 do            | Thomas W. Haslam       | 5 do                               | ...                  | ...                                 |
|      | 15 June          | William H. Cottle      | 8 do                               | ...                  | ...                                 |
|      | 1 July           | Cornelius C. Linton    | 9 do                               | 29 Feb. 1844         | 15 April 1858                       |
|      | 18 Aug.          | T. J. R. Middlemist    | 1 April                            | ...                  | ...                                 |
|      | 18 do            | William G. Davidson    | 1 do                               | 22 April 1844        | 7 May 1853                          |
| 630  | 29 do            | Abraham Goodall        | 21 do                              | 24 do                | 1 Jan. 1859                         |
|      | 27 do            | James Kellie           | 11 May                             | 7 July               | ...                                 |
|      | 27 do            | James Woodford         | 27 do                              | ...                  | ...                                 |
|      | 27 do            | George A. Austen       | 27 do                              | ...                  | ...                                 |
|      | 27 do            | Charles James Cowie    | 27 do                              | ...                  | ...                                 |
| 635  | 15 Sept.         | Thomas Willy           | 30 do                              | ...                  | ...                                 |
|      | 15 do            | John J. Purves         | 30 do                              | 31 July 1844         | ...                                 |
|      | 15 do            | G. Evans Edgcome       | 30 do                              | 26 Sept.             | ...                                 |
|      | 20 Dec.          | David Sturrock, M.D.   | 27 Aug.                            | 28 Feb. 1845         | ...                                 |
|      | 25 Jan. 1830     | John Lovell            | 30 do                              | 3 June               | 11 July 1859                        |
| 640  | 25 do            | Alexander Shewan       | 30 do                              | 10 do                | ...                                 |
|      | 25 do            | John Gill              | 30 do                              | 5 Jan. 1846          | ...                                 |
|      | 6 May            | Alexander Allardice    | 2 Oct.                             | ...                  | ...                                 |
|      | 11 Mar.          | Robert Plumbe          | 10 do                              | 31 Jan. 1846         | ...                                 |
|      | 6 May            | John W. Maillardet     | 25 Nov.                            | 31 do                | ...                                 |
| 645  | 20 do            | Agnew Mackintosh       | 12 Jan. 1830                       | 19 April             | ...                                 |
|      | ...              | Thomas Prendergast     | 17 do                              | ...                  | ..                                  |
|      | 24 May 1830      | William Gilchrist      | 17 do                              | 1 July 1846          | ..                                  |
|      | 15 July          | James Thomas Bell      | 5 Feb.                             | ...                  | ...                                 |
|      | 18 June          | Thomas H. Cannan       | 27 do                              | 7 Aug. 1846          | ...                                 |
| 650  | 3 July           | Edward Smith           | 5 Mar.                             | 19 do                | ...                                 |
|      | 7 do             | George M. Scott        | 8 do                               | ...                  | ...                                 |
|      | 17 do            | Wm. Middlemass         | 8 do                               | 18 Dec. 1846         | ...                                 |
|      | 5 Sept.          | Thomas D. Harrison     | 28 do                              | 12 Jan. 1847         | ...                                 |
|      | 29 Aug.          | John Hichens           | 1 May                              | 15 Feb.              | ...                                 |
| 655  | 11 Oct.          | Colin Rogers, M.D.     | 4 June                             | ...                  | ...                                 |
|      | 23 Aug.          | E. C. Collins, V.S.    | 23 Aug.                            | ...                  | ...                                 |
|      | 19 Dec.          | Henry Goodall          | 24 do                              | 28 Feb. 1847         | ...                                 |
|      | 19 do            | John Forbes            | 24 do                              | 28 do                | 3 May 1861                          |
|      | 20 Feb. 1831     | Hugh Cheape            | 15 Oct.                            | 2 Mar.               | ...                                 |
| 655  | 20 do            | Robert R. Gream        | 15 do                              | ...                  | ...                                 |
|      | 4 June           | Alexander Wight        | 10 Dec.                            | ...                  | ...                                 |
|      | 30 do            | Thomas White           | 22 Jan. 1831                       | 22 Mar. 1847         | ...                                 |
|      | 11 May           | Alexr. James Will      | 22 do                              | ...                  | ...                                 |

| Promoted to<br>Medical<br>Board. | Retired from<br>the Service. | Died.         | Remarks.                                                                                                                 |
|----------------------------------|------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------|
| ...                              | ...                          | 25 Oct. 1843  |                                                                                                                          |
| ...                              | ..                           | 29 Jan. 1835  |                                                                                                                          |
| ...                              | ...                          | 13 Mar. 1833  |                                                                                                                          |
| ...                              | ...                          | 13 June 1838  |                                                                                                                          |
| ...                              | ...                          | 31 Jan. 1832  |                                                                                                                          |
| ...                              | 25 Feb. 1837                 | ...           |                                                                                                                          |
| ...                              | ..                           | 7 June 1832   |                                                                                                                          |
| ...                              | 2 June 1849                  | ...           |                                                                                                                          |
| ...                              | ..                           | 6 Mar. 1837   |                                                                                                                          |
| ...                              | ...                          | 7 June 1831   |                                                                                                                          |
| ...                              | ...                          | 14 Oct. 1831  |                                                                                                                          |
| ...                              | ...                          | 26 April 1836 |                                                                                                                          |
| ...                              | 28 Feb. 1863                 | ..            |                                                                                                                          |
| ...                              | ...                          | 12 April 1837 |                                                                                                                          |
| ...                              | 3 Oct. 1862                  | ...           |                                                                                                                          |
| ...                              | 22 Feb. 1861                 | ...           |                                                                                                                          |
| ...                              | 29 Nov. 1859                 | ...           |                                                                                                                          |
| ...                              | ...                          | 1 Sept. 1838  |                                                                                                                          |
| ...                              | ...                          | 25 do 1832    |                                                                                                                          |
| ...                              | ...                          | 2 do 1843     |                                                                                                                          |
| ...                              | ...                          | 22 May 1834   |                                                                                                                          |
| ...                              | ...                          | 22 Mar. 1847  |                                                                                                                          |
| ...                              | ...                          | 9 Aug. 1849   |                                                                                                                          |
| ...                              | 6 Jan. 1852                  | ...           |                                                                                                                          |
| ...                              | 27 Aug. 1863                 | ...           |                                                                                                                          |
| ...                              | 18 Feb. 1860                 | ...           |                                                                                                                          |
| ...                              | 13 Oct. 1852                 | 31 May 1854   |                                                                                                                          |
| ...                              | ...                          | 18 July 1839  |                                                                                                                          |
| ...                              | 30 Sept. 1849                | ...           |                                                                                                                          |
| ...                              | 1 do 1860                    | 19 Dec. 1862  |                                                                                                                          |
| ...                              | 30 June 1852                 | 2 July 1860   |                                                                                                                          |
| ...                              | ...                          | ..            | Not admitted, vide extract of a letter from<br>the Court of Directors, dated 18th April<br>1832, or pp. No. 136 of 1832. |
| ...                              | 16 Mar. 1855                 | ...           |                                                                                                                          |
| ...                              | ... 1837                     | ...           |                                                                                                                          |
| ...                              | 11 Decr. 1852                | 21 May 1854   | Pensioned on Lord Clive's Fund, vide G.<br>[O. 6th February 1833.                                                        |
| ...                              | ...                          | 29 Jan. 1848  |                                                                                                                          |
| ...                              | ...                          | 4 May 1837    |                                                                                                                          |
| ...                              | 24 Aug. 1850                 | ...           |                                                                                                                          |
| ...                              | 29 Febr. 1852                | ...           |                                                                                                                          |
| ...                              | 10 Feb. 1856                 | ...           |                                                                                                                          |
| ...                              | ...                          | 20 Mar. 1837  |                                                                                                                          |
| ...                              | 10 Jan. 1854                 | 16 July 1863  |                                                                                                                          |
| ...                              | 30 do 1863                   | ...           |                                                                                                                          |
| ...                              | 28 Feb. 1863                 | ...           |                                                                                                                          |
| ...                              | 28 April 1852                | ...           |                                                                                                                          |
| ...                              | 20 Dec. 1836                 | ...           | Granted a pension from Lord Clive's Fund<br>[in Europe.                                                                  |
| ...                              | ...                          | 8 Nov. 1839   |                                                                                                                          |
| ...                              | 20 Feb. 1861                 | 21 Feb. 1862  |                                                                                                                          |
| ...                              | ...                          | 23 Feb. 1847  |                                                                                                                          |

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| No. | Date of arrival | Names.                   | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|-----------------|--------------------------|------------------------------------|----------------------|-------------------------------------|
| 660 | 10 Sept. 1831   | George M. Watson...      | 10 Mar. 1831                       | ...                  | ...                                 |
|     | 25 July         | Andrew Simpson, M.D.     | 9 April                            | 2 Sept. 1847         | ...                                 |
|     | 20 Aug.         | James Cook ...           | 7 May                              | ...                  | ...                                 |
|     | 9 Oct.          | Michie F. Anderson...    | 15 do                              | 29 Jan. 1848         | ...                                 |
|     | 9 do            | Charles Irving Smith...  | 15 do                              | 29 Feb.              | 4 Oct. 1862                         |
| 665 | 30 Nov.         | James Hamlyn ...         | 7 June                             | 3 Sept.              | ...                                 |
|     | 22 Sept.        | John Quin ...            | 10 do                              | ...                  | ...                                 |
|     | 22 do           | John Drever ...          | 12 do                              | 14 Oct. 1848         | ...                                 |
|     | 22 do           | Robert Hall Manley...    | 12 do                              | 1 Jan. 1849          | ...                                 |
|     | 20 Dec.         | John O. H. Andrews.      | 2 July                             | ...                  | ...                                 |
| 670 | 5 Feb. 1832     | Edward Curling ...       | 9 do                               | ...                  | ...                                 |
|     | 18 Dec. 1831    | Geo. John Jackson ...    | 24 Aug.                            | ...                  | ...                                 |
|     | 18 do           | William Evans. ...       | 24 do                              | 15 Jan. 1849         | ...                                 |
|     | 21 Feb. 1832    | Colin Paterson, M.D.     | 22 Oct.                            | 2 June               | 31 Nov. 1862                        |
|     | 28 April        | John Colin Campbell.     | 15 Nov.                            | 9 Aug.               | ...                                 |
| 675 | 28 do           | David Young ...          | 15 do                              | ...                  | ...                                 |
|     | 24 May          | John Charles Fuller...   | 27 Jan. 1832                       | 31 Aug. 1849         | ...                                 |
|     | 29 June         | John Henry Heaton...     | 30 do                              | ...                  | ...                                 |
|     | 2 do            | William Scott ...        | 11 Feb.                            | ...                  | ...                                 |
|     | 6 July          | James Dorward ...        | 12 do                              | 31 Aug. 1849         | 25 Feb. 1862                        |
| 680 | 15 June         | C. Jackson, V. S. ...    | ...                                | ...                  | ...                                 |
|     | 10 Oct.         | W. H. Wormsley, V.S.     | ...                                | ...                  | ...                                 |
|     | 6 July          | John Cardew, M.D. ...    | 12 Feb. 1832                       | ...                  | ...                                 |
|     | 6 do            | John Davies ...          | 12 do                              | ...                  | ...                                 |
|     | 24 Sept.        | Wm. B. Thompson...       | 27 May                             | 20 Sept. 1849        | ...                                 |
| 685 | 24 do           | William Griffith ...     | 27 do                              | ...                  | ...                                 |
|     | 24 Oct.         | P. Maria Benza, M. D.    | 27 June                            | ...                  | ...                                 |
|     | 31 Dec.         | Stewart Thomas Lyell     | 12 Aug.                            | 30 Sept. 1849        | ...                                 |
|     | 31 Jan. 1833    | J. Edward Porteous.      | 19 do                              | ...                  | ...                                 |
|     | 29 Dec. 1832    | Samuel Cox ...           | 21 do                              | 30 Sept. 1849        | ...                                 |
| 690 | 7 March 1833    | William Beauchamp.       | 24 Oct.                            | 30 do                | ...                                 |
|     | 22 April        | Charles Kevin ...        | 24 Nov.                            | 8 Dec. 1849          | ...                                 |
|     | 22 do           | John Conwell ...         | 24 do                              | ...                  | ...                                 |
|     | 12 do           | B. Jones Everitt ...     | 2 Dec.                             | ...                  | ...                                 |
|     | 25 June         | W. D. D. La Touche, M.D. | 8 do                               | ...                  | ...                                 |
| 695 | 19 May          | Robert H. Buchanan.      | 12 Jan. 1833                       | 2 Jan. 1850          | ...                                 |
|     | 19 do           | G. A. Pegler, V. S. ...  | ...                                | ...                  | ...                                 |
|     | 2 June          | James Cornfoot, M. D.    | 27 Jan. 1833                       | 9 Jan. 1850          | ...                                 |
|     | 12 Aug.         | T. Thomson Smith...      | 26 Mar.                            | 31 do                | ...                                 |
|     | 12 do           | John Emelius Mayer.      | 26 do                              | 28 Feb.              | 1 Mar. 1862                         |
| 700 | 25 do           | David Trail ...          | 15 April                           | ...                  | ...                                 |
|     | 8 Oct.          | James Chalmers ...       | 5 June                             | ...                  | ...                                 |
|     | 26 do           | Robert Hicks ...         | 19 do                              | 1 Aug. 1850          | ...                                 |
|     | 8 Jan. 1834     | E. Gustavus Bedwell.     | 7 July                             | 24 do                | ...                                 |
|     | 24 Dec. 1833    | John Fulcher Hastie.     | 22 Aug.                            | ...                  | ...                                 |
| 705 | 29 Mar. 1834    | William Mackintosh.      | 4 Nov.                             | ...                  | ...                                 |
|     | 28 June         | Patrick A. Andrew...     | 23 do                              | 31 Oct. 1850         | ...                                 |

| Promoted to<br>Medical<br>Board | Retired from<br>the Service. | Died.         | Remarks.                                                                                                 |
|---------------------------------|------------------------------|---------------|----------------------------------------------------------------------------------------------------------|
| ...                             | ...                          | — 1837        |                                                                                                          |
| ...                             | 31 Oct. 1850                 | ...           |                                                                                                          |
| ...                             | 31 Dec. 1834                 | ..            | Resigned the service.                                                                                    |
| ...                             | 15 Mar. 1853                 | ...           |                                                                                                          |
| ...                             | ...                          | ...           |                                                                                                          |
| ...                             | 28 Feb. 1855                 | ...           |                                                                                                          |
| ...                             | ...                          | 12 Aug. 1834  |                                                                                                          |
| ...                             | 9 Dec. 1854                  | ...           |                                                                                                          |
| ...                             | 28 Jany.                     | 25 July 1861  | Transferred to the Invalid Establishment,                                                                |
| ...                             | ...                          | 4 Mar. 1835   | [8th December 1849.                                                                                      |
| ...                             | ...                          | 7 May 1833    |                                                                                                          |
| ...                             | ...                          | ..            | Discharged the service, 20th October 1834                                                                |
| ...                             | 29 Nov. 1859                 | ...           | [by sentence of a Court Martial.                                                                         |
| ...                             | ...                          | 24 Feb. 1863  |                                                                                                          |
| ...                             | ...                          | ...           |                                                                                                          |
| ...                             | ...                          | 15 Mar. 1833  |                                                                                                          |
| ...                             | 3 Nov. 1852                  | ...           |                                                                                                          |
| ...                             | 15 June 1836                 | ...           | Placed on Lord Clive's Fund by the Court<br>of Directors, vide G. O. 11th Octo-<br>ber 1836.             |
| ...                             | ...                          | 8 May 1838    |                                                                                                          |
| ...                             | ...                          | ...           |                                                                                                          |
| ...                             | 22 April 1846                | 27 Jany. 1859 |                                                                                                          |
| ...                             | ...                          | 10 Nov. 1843  |                                                                                                          |
| ...                             | ...                          | ...           | Discharged the service by sentence of a<br>Court Martial, vide G. O. C. C., 14th<br>July 1838, page 205. |
| ...                             | ...                          | 15 April 1837 |                                                                                                          |
| ...                             | ...                          | 23 Sept. 1854 |                                                                                                          |
| ...                             | ...                          | 9 Feb. 1845   |                                                                                                          |
| ...                             | ...                          | 22 Jany. 1839 |                                                                                                          |
| ...                             | ...                          | 17 July 1858  |                                                                                                          |
| ...                             | ...                          | 18 Aug. 1849  |                                                                                                          |
| ...                             | 27 April 1856                | ...           |                                                                                                          |
| ...                             | 18 Sept. 1856                | ...           |                                                                                                          |
| ...                             | 7 Nov. 1860                  | ...           |                                                                                                          |
| ...                             | ...                          | 31 Jany. 1835 |                                                                                                          |
| ...                             | ...                          | 20 April 1840 |                                                                                                          |
| ...                             | ...                          | 7 Oct. 1834   |                                                                                                          |
| ...                             | 28 Feb. 1857                 | 25 June 1863  |                                                                                                          |
| ...                             | ...                          | 20 Dec. 1833  |                                                                                                          |
| ...                             | 22 Jan. 1853                 | ...           |                                                                                                          |
| ...                             | ...                          | 8 Feb. 1853   |                                                                                                          |
| ...                             | ...                          | ...           |                                                                                                          |
| ...                             | ...                          | 12 Feby. 1843 |                                                                                                          |
| ...                             | 22 Feb. 1834                 | ...           | Resigned the service.                                                                                    |
| ...                             | 30 June 1853                 | ...           |                                                                                                          |
| ...                             | ...                          | 16 May 1856   |                                                                                                          |
| ...                             | ...                          | 3 Nov. 1837   |                                                                                                          |
| ...                             | ...                          | 19 April 1844 |                                                                                                          |
| ...                             | ...                          | 4 Mar. 1856   |                                                                                                          |



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| Nos. | Date of arrival. | Names.                           | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|----------------------------------|------------------------------------|----------------------|-------------------------------------|
| 710  | 16 May 1834      | Wm. Preston Molle...             | 28 Nov. 1833                       |                      |                                     |
|      | 31 July          | George Smith Scott               | 6 April 1834                       | 9 Dec. 1850          |                                     |
|      | 20 Aug.          | James Glen                       | 20 do                              |                      |                                     |
|      | 18 Oct.          | James Shaw                       | 19 May                             | 31 Jany. 1851        | 1 Mar. 1863                         |
|      | 17 May 1835      | James Supple                     | 21 Dec.                            | 12 Feb.              |                                     |
| 715  | 17 do            | William Rose                     | 21 do                              |                      |                                     |
|      | 17 do            | Robert Henry Rennick             | 21 do                              | 13 Feb. 1851         |                                     |
|      | 13 do            | W. Mackenzie, M.D.               | 14 Jany. 1835                      | 15 do                | 5 Mar. 1863                         |
|      | 13 do            | George Morrogh, M.D.             | 14 do                              | 24 March             |                                     |
|      | 13 do            | John Kerbey                      | 14 do                              |                      |                                     |
| 720  | 17 do            | Charles Ferrier                  | 21 do                              |                      |                                     |
|      | 25 July          | Charles Don                      | 9 Feb.                             |                      |                                     |
|      | 2 do             | Peter Roe, M. D.                 | 24 do                              |                      |                                     |
|      | 9 Sept.          | Robert Carlyle, M. D.            | 11 May                             |                      |                                     |
|      | 29 do            | John Middlemass                  | 1 June                             | 6 Jany. 1852         |                                     |
| 725  | 4 Oct.           | John Cadenhead                   | 21 do                              |                      |                                     |
|      | 16 Feb. 1836     | John Willoughby Gordon Macdonell | 8 Sept.                            |                      |                                     |
|      | 21 do            | T. Aston, V. S.                  |                                    |                      |                                     |
|      | 21 do            | Thomas C. Jerdon                 | 11 Sept.                           | 29 Feb. 1852         |                                     |
|      | 11 May           | James Anderson, M. D.            | 8 Dec.                             | 28 April             |                                     |
| 730  | 20 do            | Joseph Adams, M. D.              | 16 Jany. 1836                      |                      |                                     |
|      | 20 do            | John Grant, M. D.                | 16 do                              | 30 June 1852         |                                     |
|      | 11 do            | Edward S. Cumming                | 17 do                              |                      |                                     |
|      | 11 do            | Henry O. Snowden                 | 17 do                              |                      |                                     |
|      | 6 June           | Alexr. Lorimer, M.D.             | 6 Feb.                             | 3 Aug. 1852          |                                     |
| 735  | 26 May           | John Mathison, M. D.             | 9 do                               | 13 Oct.              |                                     |
|      | 5 June           | John Findlay Arthur              | 14 do                              | 29 do                |                                     |
|      | 12 July          | Augustus W. Collings             | 5 Mar.                             |                      |                                     |
|      | 16 do            | Thomas W. Stewart                | 8 do                               |                      |                                     |
|      | 10 Sept.         | James Dodd                       | 16 April                           | 3 Nov. 1852          |                                     |
| 740  | 20 do            | D. Macpherson, M. D.             | 18 May                             | 11 Dec.              |                                     |
|      | 21 do            | Edward G. Balfour                | 2 June                             | 31 do                | 28 Aug. 1863                        |
|      | 21 do            | Robert Maginness                 | 2 do                               |                      |                                     |
|      | 3 Oct.           | Thos. G. Johnston, M. D.         | 8 do                               | 22 Jany. 1853        |                                     |
|      | 27 Nov.          | Wm. Law Ogilby Moore             | 30 July                            |                      |                                     |
| 745  | 24 Dec.          | James Robson                     | 9 Aug.                             | 8 Feb. 1853          |                                     |
|      | 29 do            | John D. V. Packman               | 26 do                              | 28 do                |                                     |
|      | 27 Jany. 1837    | Richardson Colthurst             | 18 Sept.                           |                      |                                     |
|      | 3 May            | James Sanderson                  | 27 Oct.                            | 15 Mar. 1853         |                                     |
|      | 27 do            | Joshua Williams                  | 17 Dec.                            | 30 June              |                                     |
| 750  | 13 June          | William Holmes                   | 15 Feb. 1837                       |                      |                                     |
|      | 23 May           | John Henry Orr                   | 22 do                              | 17 July 1853         | 11 Oct. 1863                        |
|      | 26 do            | David D. Foulis, M. D.           | 24 do                              | 15 Nov.              |                                     |
|      | 27 do            | John A. Reynolds                 | 28 do                              | 24 do                |                                     |
|      | 29 June          | Samuel K. Parson                 | 4 April                            |                      |                                     |
|      | 29 do            | Wm. George Prichard              | 4 do                               | 15 Dec. 1853         |                                     |
|      | 13 Sept.         | Joseph M. Jackson                | 2 June                             | 1 Jany. 1854         |                                     |
|      | 7 Feb. 1838      | William Aitken Carlan            | 8 Aug.                             |                      |                                     |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                                                                                    |
|----------------------------|---------------------------|---------------|-------------------------------------------------------------------------------------------------------------|
| ...                        | 2 Dec. 1846               | ...           |                                                                                                             |
| ...                        | ...                       | 15 Feb. 1858  |                                                                                                             |
| ...                        | ...                       | 11 Sept. 1837 |                                                                                                             |
| ...                        | ...                       | ...           | Inspector General of Hospitals, 5th March [1863.                                                            |
| ...                        | 21 Dec. 1857              | ...           |                                                                                                             |
| ...                        | ...                       | 28 Dec. 1845  |                                                                                                             |
| ...                        | ...                       | ...           | C. B. March 22nd 1859.                                                                                      |
| ...                        | 26 June 1858              | ...           |                                                                                                             |
| ...                        | ...                       | 14 April 1842 |                                                                                                             |
| ...                        | ...                       | 19 do 1848    |                                                                                                             |
| ...                        | ...                       | 2 Sept. 1844  |                                                                                                             |
| ...                        | 4 June 1845               | ...           |                                                                                                             |
| ...                        | ...                       | 2 April 1837  |                                                                                                             |
| ...                        | ...                       | 17 Nov. 1861  |                                                                                                             |
| ...                        | ...                       | 17 do 1851    |                                                                                                             |
| ...                        | ...                       | 12 June 1843  |                                                                                                             |
| ...                        | ...                       | ...           | Resigned, 16th March 1847. Re-admitted, [4th December 1848.                                                 |
| ...                        | ...                       | 7 Jany. 1854  |                                                                                                             |
| ...                        | ...                       | 15 May 1843   | Struck off as drowned.                                                                                      |
| ...                        | 23 Aug. 1856              | ...           |                                                                                                             |
| ...                        | ...                       | ...           | Discharged from the Service by sentence of a Court Martial, vide G. O. C. C., 1st September 1838, page 261. |
| ...                        | ...                       | 13 May 1841   |                                                                                                             |
| ...                        | 14 June 1861              | ...           |                                                                                                             |
| ...                        | ...                       | 26 Decr. 1852 | Transferred to the Invalid Establishment, [29th October 1852.                                               |
| ...                        | 20 Feb. 1860              | ...           |                                                                                                             |
| ...                        | ...                       | 29 July 1838  |                                                                                                             |
| ...                        | 31 Dec. 1841              | ...           |                                                                                                             |
| ...                        | 26 July 1855              | ...           |                                                                                                             |
| ...                        | ...                       | ...           | Inspector General of Hospitals, 8th Jany. [1856.                                                            |
| ...                        | ...                       | 23 July 1842  |                                                                                                             |
| ...                        | 9 Aug. 1859               | ...           |                                                                                                             |
| ...                        | 4 Nov. 1844               | 11 May 1849   |                                                                                                             |
| ...                        | 8 April 1859              | ...           |                                                                                                             |
| ...                        | ...                       | ...           | Mr. Packman's services have been dispensed with by order of the Court of Directors, from 5th August 1858.   |
| ...                        | 1 May 1863                | 17 Decr. 1838 |                                                                                                             |
| ...                        | 2 July 1858               | ...           |                                                                                                             |
| ...                        | ...                       | 26 June 1838  |                                                                                                             |
| ...                        | ...                       | ...           | C. B. 16th November 1858.                                                                                   |
| ...                        | ...                       | 10 April 1855 |                                                                                                             |
| ...                        | ...                       | 15 June 1850  |                                                                                                             |
| ...                        | ...                       | ...           |                                                                                                             |
| ...                        | ...                       | 24 May 1841   |                                                                                                             |

| No. | Date of arrival. | Names.                   | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|--------------------------|------------------------------------|----------------------|-------------------------------------|
| 755 | 27 Dec. 1837     | Charles G. E. Ford...    | 29 Aug. 1837                       | 8 Jan. 1854          | ...                                 |
|     | 17 April 1838    | George D. Gordon M.D.    | 21 Dec.                            | ...                  | ...                                 |
|     | 12 May           | Donald Macfarlane M.D.   | 11 Jan. 1838                       | 14 Feb. 1854         | ...                                 |
|     | 13 June          | Andrew C. B. Neill, M.D. | 1 Mar.                             | 23 Sept.             | ...                                 |
|     | 18 do            | Charles Woodford ...     | 1 do                               | ...                  | ...                                 |
| 760 | 13 do            | John Coleridge, ...      | 1 do                               | ...                  | ...                                 |
|     | 4 July           | Henry W. Porteous...     | 10 Feb.                            | 24 Feb. 1854         | ...                                 |
|     | 6 do             | John Kennedy, M.D.       | 27 do                              | 29 Oct. 1854         | ...                                 |
|     | 6 do             | David T. Morton ...      | 27 do                              | 29 do                | ...                                 |
|     | 15 Aug.          | Wm. C. Maclear, M.D.     | 29 April                           | 9 Dec.               | ...                                 |
| 765 | 15 do            | John Borlase Stevens     | 29 do                              | 1 Jan. 1855          | ...                                 |
|     | 11 Nov.          | George F. H. Primrose    | 4 July                             | 18 Feb.              | ...                                 |
|     | 18 Dec.          | Charles W. Pickering     | 21 Aug.                            | 21 do                | ...                                 |
|     | 2 April 1839     | Francis Wakefield ...    | 1 Nov.                             | ...                  | ...                                 |
|     | 26 do            | William Kirkwood...      | 24 Jan. 1839                       | ...                  | ...                                 |
| 770 | 17 May           | Benjamin G. Evans...     | 15 do                              | ...                  | ...                                 |
|     | 17 do            | Ambrose H. Ashley...     | 15 do                              | ...                  | ...                                 |
|     | 17 do            | John Thomas Blenkin      | 15 do                              | ...                  | ...                                 |
|     | 17 do            | William Moorhead...      | 15 do                              | ...                  | ...                                 |
|     | 17 do            | T. F. Fernandez, M.D.    | 22 do                              | 28 Feb. 1855         | ...                                 |
| 775 | 20 June          | Arthur Cheyne, M. D.     | 24 Feb.                            | ...                  | ...                                 |
|     | 20 do            | Henry Stanbrough ...     | 24 do                              | ...                  | ...                                 |
|     | 25 do            | Henry E. Hadmen ...      | 26 Jan.                            | 16 Mar. 1855         | ...                                 |
|     | 10 July          | Benjamin S. Chimm...     | 9 Mar.                             | 10 April             | ...                                 |
|     | 28 Aug.          | James C. Burton, M.D.    | 14 May                             | 26 July              | ...                                 |
| 780 | 6 Sept.          | M. W. Lloyd, V. S.       | 14 do                              | ...                  | ...                                 |
|     | 6 Jan. 1840      | Henry Smith ...          | 12 Sept. 1839                      | 12 Feb. 1856         | ...                                 |
|     | 18 do            | James Reid ...           | 23 do                              | 4 Mar.               | ...                                 |
|     | 2 Feb.           | Charles Timins ...       | 1 do                               | 10 Feb.              | ...                                 |
|     | 28 do            | Edward S. Tribe ...      | 26 Oct.                            | 30 Mar.              | ...                                 |
| 785 | 21 April         | Moses Rogers ...         | 3 Dec.                             | 16 May               | ...                                 |
|     | 21 do            | Charles Barclay ...      | 3 do                               | 27 April             | ...                                 |
|     | 21 do            | James Peter, M. D. ...   | 3 do                               | ...                  | ...                                 |
|     | 10 June          | Charles D. Currie, M.D.  | 3 Jan. 1840                        | 28 Aug.              | ...                                 |
|     | 10 do            | Alex. H. Howe, M. D.     | do                                 | ...                  | ...                                 |
| 790 | 16 do            | George G. Holmes ...     | 8 Feb.                             | ...                  | ...                                 |
|     | 16 do            | James Black Steel ...    | 8 do                               | ...                  | ...                                 |
|     | 16 do            | Ambrose Blacklock...     | 8 do                               | 21 Dec. 1857         | ...                                 |
|     | 17 do            | William R. Gingell...    | 6 Jan.                             | 1 Oct. 1856          | ...                                 |
|     | 17 do            | George C. Courtney...    | 6 do                               | ...                  | ...                                 |
| 795 | 17 do            | William Lloyd, M.D....   | 6 do                               | 29 Nov. 1856         | ...                                 |
|     | 17 do            | James L. Ranking ...     | 6 do                               | 18 Sept.             | ...                                 |
|     | 17 do            | Charles John Martyr.     | 6 do                               | ...                  | ...                                 |
|     | 17 do            | William Johnston, M.D.   | 6 do                               | 8 Aug. 1857          | ...                                 |
|     | 17 do            | James Peterkin, M.D.     | 6 do                               | 18 Feb.              | ...                                 |
| 800 | 17 do            | John Pringle, M.D. ...   | 6 do                               | 28 do                | ...                                 |
|     | 17 do            | James Boyd ...           | 6 do                               | ...                  | ...                                 |
|     | 17 do            | John T. Doune, M.D.      | 6 do                               | ...                  | ...                                 |
|     | 29 do            | Thomas W. Whitelock      | 10 Mar.                            | 24 Mar. 1858         | ...                                 |
|     | 17 July          | John W. Mudge, M.D...    | 8 do                               | 15 Feb.              | ...                                 |
| 805 | 17 do            | Eaglesfield J. Barker.   | 12 do                              | 27 June              | ...                                 |

ment, under the Presidency of Fort St. George, up to 1863. 150

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                  |
|----------------------------|---------------------------|---------------|-------------------------------------------|
| ...                        | ...                       | 28 Aug. 1853  |                                           |
| ...                        | 24 Mar. 1858              | ...           |                                           |
| ...                        | ...                       | 20 Mar. 1840  |                                           |
| ...                        | ...                       | 30 Dec. 1842  |                                           |
| ...                        | ...                       | ...           |                                           |
| ...                        | ...                       | ...           |                                           |
| ...                        | ...                       | ...           |                                           |
| ...                        | ...                       | 29 Nov. 1856  |                                           |
| ...                        | 31 Mar. 1841              | ...           | Resigned the Service.                     |
| ...                        | ...                       | 16 Mar. 1849  |                                           |
| ...                        | ...                       | 18 Nov. 1845  | [health.                                  |
| ...                        | 17 Mar. 1852              | ...           | Resigned the Service on account of ill    |
| ...                        | ...                       | 25 July 1853  |                                           |
| ...                        | ...                       | 29 Sept. 1847 | [tored, 11th November 1858.               |
| ...                        | 6 Nov. 1859               | ...           | Cashiered, 18th February 1857, and res-   |
| ...                        | ...                       | 21 Aug. 1854  | Dismissed from the Service, 8th Fe-       |
| ...                        | ...                       | 14 Aug. 1863  | [bruary 1853.                             |
| ...                        | ...                       | 25 Feb. 1862  |                                           |
| ...                        | ...                       | 19 June 1844  | Struck off, 19th April 1841; re-admitted, |
| ...                        | 29 Nov. 1859              | ...           | [7th July 1842.                           |
| ...                        | ...                       | ...           |                                           |
| ...                        | ...                       | ...           |                                           |
| ...                        | ...                       | 25 Jany. 1843 |                                           |
| ...                        | ...                       | 29 Nov. 1861  |                                           |
| ...                        | 12 Oct. 1853              | ...           | Resigned the Service.                     |
| ...                        | ...                       | 6 Feb. 1854   |                                           |
| ...                        | ...                       | 2 May 1841    |                                           |
| ...                        | ...                       | ...           |                                           |
| ...                        | 28 May 1861               | 10 Aug. 1863  |                                           |
| ...                        | ...                       | 26 April 1843 |                                           |
| ...                        | 18 Nov. 1859              | ...           | Resigned the Service on account of ill    |
| ...                        | ...                       | ...           | [health.                                  |
| ...                        | ...                       | 12 Mar. 1846  |                                           |
| ...                        | ...                       | ...           |                                           |
| ...                        | ...                       | ...           |                                           |
| ...                        | ...                       | 2 Mar. 1842   |                                           |
| ...                        | ...                       | 1 July 1848   |                                           |
| ...                        | 12 Aug. 1861              | ...           |                                           |
| ...                        | ...                       | ...           |                                           |
| ...                        | 4 May 1859                | ..            |                                           |

| Nos. | Date of arrival. | Names.                  | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|-------------------------|------------------------------------|----------------------|-------------------------------------|
|      | 9 Aug. 1840      | William W. Rawes...     | 14 Apr. 1840                       | 29 June 1858         | ...                                 |
|      | 19 do            | George F. H. Eastall... | 11 May                             | ...                  | ...                                 |
|      | 19 do            | John Welsh, M. D. ...   | 11 do                              | ...                  | ...                                 |
|      | 26 Oct.          | Edward M. Jackson...    | 6 June                             | 2 July 1858          | ...                                 |
| 810  | 15 Jany. 1841    | Edward James            | 30 Sept.                           | ...                  | ...                                 |
|      | 27 do            | John Tait               | 12 Oct.                            | ...                  | ...                                 |
|      | 28 do            | John A. Horak, M. D.    | 6 Sept.                            | 3 July 1858          | ...                                 |
|      | 9 May            | William Hilbers         | 25 Dec. 1840                       | 20 Dec.              | ...                                 |
|      | 10 do            | William Henry Seales    | 25 Jany. 1841                      | ...                  | ...                                 |
| 815  | 5 do             | James Mackintosh        | 22 Dec. 1840                       | 5 Aug. 1858          | ...                                 |
|      | 11 do            | John FitzPatrick        | 29 do                              | 2 Jany. 1859         | ...                                 |
|      | 20 do            | William Scott, M.D.     | 30 Jany. 1841                      | 9 April              | ...                                 |
|      | 20 do            | Alfred Wilkinson        | 30 do                              | ...                  | ...                                 |
|      | 1 June           | Thomas Dunlop           | 17 Feb.                            | ...                  | ...                                 |
| 820  | 1 do             | William H. S. Burn.     | 17 do                              | 5 May 1859           | ...                                 |
|      | 1 do             | John K. Ogilvie, M.D.   | 17 do                              | 10 Aug.              | ...                                 |
|      | 30 do            | Charles Richardson      | 8 Jany.                            | ...                  | ...                                 |
|      | 4 July           | Alex. C. Macleod        | 8 Mar.                             | 26 Oct. 1859         | ...                                 |
|      | 4 do             | Robert R. Suttleff      | 8 do                               | 19 Nov.              | ...                                 |
| 825  | 8 do             | James Ratton            | 2 Apr.                             | 30 do                | ...                                 |
|      | 19 Aug.          | William Forrester       | 1 May                              | 30 do                | ...                                 |
|      | 24 do            | Richard Chaytor, M.D.   | 10 do                              | ...                  | ...                                 |
|      | 22 Sept.         | Frid. LeMesurier, M.D.  | 21 June                            | ...                  | ...                                 |
|      | 30 do            | Edward Young            | 22 do                              | ...                  | ...                                 |
| 830  | 20 Dec.          | George Dry              | 14 Aug.                            | ...                  | ...                                 |
|      | 25 Feb. 1842     | Henry James Penny       | 3 Oct.                             | 30 Nov. 1859         | ...                                 |
|      | 24 April         | Henry G. Luttrell, M.D. | 1 Dec.                             | ...                  | ...                                 |
|      | 25 May           | Henry T. W. Harper.     | 30 Jany. 1842                      | 1 Mar. 1860          | ...                                 |
|      | 3 June           | Henry Young             | 8 do                               | 19 Feb.              | ...                                 |
| 835  | 3 do             | K. McK. Adams, M.D.     | 8 do                               | ...                  | ...                                 |
|      | 3 do             | Thomas L. Bell, A.M.    | 8 do                               | ...                  | ...                                 |
|      | 24 do            | John W. Tirminger.      | 15 Feb.                            | ...                  | ...                                 |
|      | 24 do            | Christopher B. Craike   | 15 do                              | 2 Sept. 1860         | ...                                 |
|      | 20 July          | William Traill, M. D.   | 21 April                           | 8 Nov. 1860          | ...                                 |
| 840  | 8 Aug.           | Samuel Brooke           | 22 do                              | ...                  | ...                                 |
|      | 8 do             | William Browne, M.D.    | 22 do                              | ...                  | ...                                 |
|      | 8 do             | James Kirkpatrick, M.D. | 30 do                              | 28 Dec. 1860         | ...                                 |
|      | 22 Sept.         | Robert Wood Spry.       | 12 June                            | ...                  | ...                                 |
|      | 22 do            | Henry Carnegie          | 19 do                              | 1 Jany. 1861         | ...                                 |
| 845  | 22 do            | James Thompson          | 19 do                              | ...                  | ...                                 |
|      | 24 Nov.          | Wm. Frid. Currie, M.D.  | 24 do                              | ...                  | ...                                 |
|      | 5 Dec.           | Mathew Kane, M. B.      | 20 Aug.                            | 23 Feb. 1861         | ...                                 |
|      | 6 do             | Quintiu T. Paterson...  | 10 do                              | ...                  | ...                                 |
|      | 6 do             | Hugh F. C. Cleghorn.    | 10 do                              | 21 Feb. 1861         | ...                                 |
| 850  | 5 Feb. 1843      | Robert Dickie, M. D.    | 27 Sept.                           | ...                  | ...                                 |
|      | 22 do            | Robert P. Linton        | 2 Aug.                             | 8 Feb. 1861          | ...                                 |
|      | 22 April         | Charles M. Duff, M. D.  | 4 Jany.                            | 2 Jany. 1860         | ...                                 |
|      | 22 do            | Alexander Hunter        | 2 Feb. 1843                        | 29 April 1861        | ...                                 |
|      | 11 June          | Charles Danbeny         | 15 April                           | ...                  | ...                                 |
| 855  | 12 do            | George Mackey, M. D.    | 28 Dec. 1842                       | 1 Mar. 1861          | ...                                 |
|      | 13 do            | John Brigham            | 22 Feb. 1843                       | ...                  | ...                                 |

| Promoted to<br>Medical<br>Board. | Retired from<br>the Service. | Died.         | Remarks.                                    |
|----------------------------------|------------------------------|---------------|---------------------------------------------|
| ...                              | ...                          | 29 Dec. 1852  |                                             |
| ...                              | ...                          | 13 June 1819  |                                             |
| ...                              | 19 Dec. 1858                 | 7 Dec. 1859   |                                             |
| ...                              | ...                          | 1 July 1845   |                                             |
| ...                              | 5 Mar. 1850                  | ...           | Resigned the Service on account of ill      |
| ...                              | ...                          | 21 Feb. 1862  | [health.                                    |
| ...                              | 31 Dec. 1860                 | ...           |                                             |
| ...                              | ...                          | 24 June 1853  |                                             |
| ...                              | 24 Dec. 1862                 | ...           |                                             |
| ...                              | ...                          | 12 Feb. 1853  |                                             |
| ...                              | ...                          | 16 do 1846    |                                             |
| ...                              | ...                          | ...           |                                             |
| ...                              | ...                          | 3 Dec. 1844   |                                             |
| ...                              | ...                          | ...           |                                             |
| ...                              | ...                          | ...           |                                             |
| ...                              | ...                          | 14 Sept. 1843 | [health.                                    |
| ...                              | 28 Oct. 1846                 | ...           | Resigned the Service on account of ill      |
| ...                              | 19 Nov. 1851                 | ...           | Do. do. do.                                 |
| ...                              | ...                          | 30 Oct. 1844  |                                             |
| ...                              | ...                          | 6 May 1843    |                                             |
| ...                              | ...                          | ...           |                                             |
| ...                              | ...                          | 27 Sept. 1856 |                                             |
| ...                              | ...                          | 6 do 1854     |                                             |
| ...                              | ...                          | 24 June       |                                             |
| ...                              | ...                          | ...           |                                             |
| ...                              | 7 Feb. 1861                  | ...           |                                             |
| ...                              | ...                          | 26 Dec. 1847  |                                             |
| ...                              | ...                          | — Jany. 1845  |                                             |
| ...                              | ...                          | ...           |                                             |
| ...                              | ...                          | 6 Feb. 1844   |                                             |
| ...                              | ...                          | 30 Oct. 1862  |                                             |
| ...                              | ...                          | 12 do 1854    |                                             |
| ...                              | ...                          | ...           | Dismissed from the service, 11th Nov. 1844. |
| ...                              | ...                          | ...           |                                             |
| ...                              | ...                          | 4 Jany. 1844  |                                             |
| ...                              | ...                          | ...           |                                             |
| ...                              | ...                          | 5 Aug. 1844   |                                             |
| ...                              | ...                          | ...           |                                             |
| ...                              | ...                          | ...           |                                             |
| ...                              | 3 Nov. 1852                  | ...           | Retired from the service on account of ill  |
| ...                              | ...                          | ...           | [health.                                    |
| ...                              | ...                          | 1 Sept. 1853  |                                             |

| No. | Date of arrival. | Names.                  | Date of rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|-----|------------------|-------------------------|------------------------------------|----------------------|-------------------------------------|
| 860 | 13 June 1843     | Keith Jopp, M. D. ..    | 22 Feb. 1843                       | ...                  | ...                                 |
|     | 15 do            | William R. James, M. D. | 25 do                              | ...                  | ...                                 |
|     | 17 do            | Hamlin Nott ...         | 12 do                              | 29 May 1861          | ...                                 |
|     | 21 July          | Frederick Fletcher. ..  | 4 April                            | 15 June              | ...                                 |
|     | 5 Sept.          | Wm. R. Babington ..     | 1 July                             | ...                  | ...                                 |
| 865 | 14 April 1844    | Andrew J. Scott, M.D.   | 1 Mar. 1844                        | 18 Nov. 1861         | ...                                 |
|     | 13 May           | John Colebrook ...      | 1 April                            | 22 Feb. 1862         | ...                                 |
|     | 25 do            | James Hay Blackwell     | 27 Jany.                           | 13 Aug. 1861         | ...                                 |
|     | 12 July          | Wm. W. Heude, M.D.      | 25 Mar.                            | 30 Nov.              | ...                                 |
|     | 21 do            | John C. W. Belcombe     | 28 do                              | ...                  | ...                                 |
| 870 | 4 Aug.           | William Williamson..    | 16 April                           | 26 Feb. 1862         | ...                                 |
|     | 15 Sept.         | George Smith, M.D...    | 3 Aug.                             | 4 Oct.               | ...                                 |
|     | 17 Jany. 1845    | William G. Jalland...   | 3 Dec.                             | ...                  | ...                                 |
|     | 4 Mar.           | John Maitland, M.D...   | 20 Jany. 1845                      | ...                  | ...                                 |
|     | 17 April         | George W. Fagg, V.S.    | ...                                | ...                  | ...                                 |
| 875 | 11 May           | John R. Skinner, M.D.   | 5 Jany.                            | ...                  | ...                                 |
|     | 19 do            | Walter Alex. Leslie..   | 11 Feb.                            | 31 Oct. 1862         | ...                                 |
|     | 28 June          | Ed. B. Dawson, V.S...   | ...                                | ...                  | ...                                 |
|     | 3 July           | John Forster ...        | 3 April                            | ...                  | ...                                 |
|     | 30 Nov.          | Fredk. L. Clemenston    | 20 Aug.                            | 21 Nov. 1862         | ...                                 |
| 880 | 8 Jany. 1846     | John Brett, M.D. ..     | 12 Sept.                           | 25 Dec.              | ...                                 |
|     | 8 do             | John McGregor, M.D.     | 12 do                              | ...                  | ...                                 |
|     | 31 do            | Aug. O. Currie, M.D.    | 20 Dec.                            | ...                  | ...                                 |
|     | 1 May            | P. G. Fitzgerald, M.D   | 20 Mar. 1846                       | 25 Feb. 1863         | ...                                 |
|     | 16 do            | Wm. J. vanSomeren...    | 7 April                            | 1 Mar.               | ...                                 |
| 885 | 21 do            | William Aitken, M.D.    | 26 Jany.                           | 31 Jany.             | ...                                 |
|     | 1 June           | Thomas Philips, V.S.    | 1 June                             | ...                  | ...                                 |
|     | 29 do            | James Crawford ...      | 20 May                             | ...                  | ...                                 |
|     | 29 do            | Charles D.Scarr, V.S.   | ...                                | ...                  | ...                                 |
|     | 28 July          | John Wilson, M.D. ...   | 26 Mar.                            | ...                  | ...                                 |
| 890 | 1 Aug.           | James Boyd Fleming      | 17 April                           | 1 Mar. 1863          | ...                                 |
|     | 19 do            | Duncan Mackenzie...     | 5 May                              | 2 May                | ...                                 |
|     | 19 Sept.         | George Ballie, M.D...   | 19 do                              | 12 do                | ...                                 |
|     | 23 do            | Alfred Jowett ...       | 27 June                            | ...                  | ...                                 |
|     | 27 do            | Edward Dixon ...        | 3 do                               | 15 Aug. 1863         | ...                                 |
| 895 | 29 do            | Philip Hatchell West    | 20 Aug.                            | ...                  | ...                                 |
|     | 5 Oct.           | James Macdonald, M.D.   | 30 April                           | ...                  | ...                                 |
|     | 26 Dec.          | Thomas Arnold, V.S.     | ...                                | ...                  | ...                                 |
|     | 26 do            | Jms. Edward Palmer      | 10 Sept.                           | ...                  | ...                                 |
|     | 5 Jany. 1847     | Edward L. I. Gaine...   | 20 July                            | ...                  | ...                                 |
| 900 | 1 June           | Geo. E. Aldred, M. D.   | 20 April 1847                      | ...                  | ...                                 |
|     | 3 March 1848     | James Cowpar ...        | 20 Jany. 1848                      | 28 Aug. 1863         | ...                                 |
|     | 11 do            | Ed. Crundall, V. S ..   | ...                                | ...                  | ...                                 |
|     | 5 April          | E. C. Crowley, V. S ..  | ...                                | ...                  | ...                                 |
|     | 5 do             | Alfred Williams ...     | 20 Feb.                            | ...                  | ...                                 |
| 905 | 7 do             | John Field, V. S. ...   | ...                                | ...                  | ...                                 |
|     | 23 June          | Arthur L. T. Cooke...   | 9 Mar. 1848                        | 5 Sept. 1863         | ...                                 |
|     | 7 Aug.           | J. M. Cullimore, V.S.   | ...                                | ...                  | ...                                 |
|     | 7 Oct.           | Lestock W. Stewart..    | 28 May                             | 11 Oct. 1863         | ...                                 |

| Promoted to Medical Board. | Retired from the Service. | Died.         | Remarks.                                                                   |
|----------------------------|---------------------------|---------------|----------------------------------------------------------------------------|
| ...                        | 20 Mar. 1858              | ...           | Retired from the Service on account of ill [health.                        |
| ...                        | ...                       | 4 July 1844   |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | 16 Dec. 1857  |                                                                            |
| ...                        | 4 Sept. 1863              | ...           |                                                                            |
| ...                        | 11 May                    | ...           |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | ...           | Dismissed from the Service, 5th Jany. 1845.                                |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | 8 Nov. 1857   |                                                                            |
| ...                        | ...                       | 28 March 1861 |                                                                            |
| ...                        | ...                       | 12 Feb. 1850  |                                                                            |
| ...                        | ...                       | 8 May 1846    |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | 28 Mar. 1860  |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | 21 Dec. 1857  |                                                                            |
| ...                        | ...                       | 17 Sept. 1853 |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | ...           | Dismissed from the Service, 2d April 1849.                                 |
| ...                        | ...                       | 26 Novr. 1857 |                                                                            |
| ...                        | ...                       | 7 Oct. 1846   |                                                                            |
| ...                        | ...                       | 23 June 1850  |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | 4 Oct. 1858   |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | 23 Nov. 1857  |                                                                            |
| ...                        | ...                       | 13 do 1854    |                                                                            |
| ...                        | ...                       | 15 Mar. 1861  |                                                                            |
| ...                        | ...                       | 18 April 1854 |                                                                            |
| ...                        | ...                       | 20 Oct. 1849  |                                                                            |
| ...                        | 23 Feb. 1861              | ...           | Dismissed from the Service, 31st July 1848.                                |
| ...                        | ...                       | ...           | Re-admitted 15th May, 1849. Resigned the Service on account of ill health. |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | 8 Sept. 1853  |                                                                            |
| ...                        | ...                       | 21 June 1859  |                                                                            |
| ...                        | ...                       | 14 April 1849 |                                                                            |
| ...                        | ...                       | 28 Oct. 1848  |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | ...           |                                                                            |
| ...                        | ...                       | ...           |                                                                            |



| Nos. | Date of arrival. | Names.                           | Date of rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|----------------------------------|------------------------------------|----------------------|-------------------------------------|
|      | 6 Jan'y. 1849    | Martin Simpson ...               | 10 Sep. 1848                       | ...                  | ...                                 |
| 30   | do               | John R. Theobalds ...            | 20 Dec.                            | ...                  | ...                                 |
| 25   | Feb.             | William H. Davids ...            | 3 Oct.                             | ...                  | ...                                 |
| 3    | April            | James Donaldson M.D.             | 20 Feb. 1849                       | ...                  | ...                                 |
| 1910 | 5 do             | George F. Trimmell ...           | 27 Dec. 1848                       | ...                  | ...                                 |
| 31   | May              | Charles J. Rogers ...            | 20 April 1849                      | ...                  | ...                                 |
| 7    | Nov.             | Edward J. Waring ...             | 22 June                            | ...                  | ...                                 |
| 24   | Feb. 1850        | George W. Walter ...             | 12 Oct.                            | ...                  | ...                                 |
| 2    | Mar.             | John George Gibbs ...            | 20 Jan'y. 1850                     | ...                  | ...                                 |
| 1915 | 2 do             | J. Liston Paul, M. D. ...        | 20 do                              | ...                  | ...                                 |
| 27   | April            | Wm. A. Jacob, M. D. ...          | 20 Mar.                            | ...                  | ...                                 |
| 2    | June             | Henry R. D. Marrett ...          | 16 Feb.                            | ...                  | ...                                 |
| 10   | do               | John Wilson ...                  | 9 Mar.                             | ...                  | ...                                 |
| 9    | Sept.            | St. G. Williams, M. D. ...       | 25 May                             | ...                  | ...                                 |
| 1920 | 27 do            | John Miller, M. D. ...           | 8 July                             | ...                  | ...                                 |
| 28   | Oct.             | Henry R. Oswald, M. D. ...       | 24 Aug.                            | ...                  | ...                                 |
| 3    | Dec.             | Henry Cholmeley, M.D. ...        | 19 do                              | ...                  | ...                                 |
| 26   | do               | John Chisholm, M. D. ...         | 14 do                              | ...                  | ...                                 |
| 26   | do               | R. H. U. Holloway V.S. ...       | 26 Dec.                            | ...                  | ...                                 |
| 1925 | 28 Jan'y. 1851   | John T. Williams ...             | 20 do                              | ...                  | ...                                 |
| 2    | Mar.             | Wm. H. Bontflower ...            | 20 Jan'y. 1851                     | ...                  | ...                                 |
| 2    | do               | Alexander A. Renton ...          | 20 do                              | ...                  | ...                                 |
| 29   | April            | T. S. Parker, V. S. ...          | 29 April                           | ...                  | ...                                 |
| 29   | do               | James Thacker, V. S. ...         | 29 do                              | ...                  | ...                                 |
| 1930 | 29 May           | George Betts ...                 | 26 Feb.                            | ...                  | ...                                 |
| 12   | June             | John A. Cox, M. D. ...           | 10 do                              | ...                  | ...                                 |
| 14   | Aug.             | Charles King ...                 | 10 April                           | ...                  | ...                                 |
| 1    | Dec.             | Frederick J. Windus ...          | 20 Oct.                            | ...                  | ...                                 |
| 14   | do               | Colvin Smith, M. D. ...          | 3 Nov.                             | ...                  | ...                                 |
| 1935 | 17 do            | James E. Dickinson ...           | 10 Sept.                           | ...                  | ...                                 |
| 17   | May 1852         | Edward D'A Evezard ...           | 27 Jan'y. 1852                     | ...                  | ...                                 |
| 30   | do               | James C. Kelly Bond ...          | 1 Feb.                             | ...                  | ...                                 |
| 13   | June             | Francis Day ...                  | 26 do                              | ...                  | ...                                 |
| 15   | Oct.             | M. D. Campbell, M.D. ...         | 24 May                             | ...                  | ...                                 |
| 1940 | 30 Nov.          | Howard B. Montgomerie, M. D. ... | 20 Oct.                            | ...                  | ...                                 |
| 25   | Dec.             | Charles Lee ...                  | 11 Sep.                            | ...                  | ...                                 |
| 1    | Jan'y. 1853      | Joseph M. Joseph, M.D. ...       | 20 Nov.                            | ...                  | ...                                 |
| 30   | do               | Patrick C. Rae, M.D. ...         | 20 Dec.                            | ...                  | ...                                 |
| 15   | Feb.             | Ed. S. Cleveland, M.D. ...       | 20 Nov.                            | ...                  | ...                                 |
| 1945 | 21 April         | William H. Harris ...            | 13 Feb. 1853                       | ...                  | ...                                 |
| 21   | do               | Ridley Porter ...                | 13 do                              | ...                  | ...                                 |
| 27   | May              | Thomas Pritchard V.S. ...        | 20 Oct. 1851                       | ...                  | ...                                 |
| 25   | July             | William H. Rean, M.D. ...        | 14 May 1853                        | ...                  | ...                                 |
| 26   | Nov.             | Alfred Sanderson, M.B. ...       | 20 Oct.                            | ...                  | ...                                 |
| 1950 | 31 Dec.          | Henry Thompson Shaw ...          | 10 Sept.                           | ...                  | ...                                 |
| 31   | do               | Clarence Cooper, M.D. ...        | 20 Nov.                            | ...                  | ...                                 |
| 1    | Jan'y. 1854      | Paterson Allen ...               | 14 Oct.                            | ...                  | ...                                 |
| 7    | April            | Arthur Umphelbey, M.D. ...       | 20 Feb. 1854                       | ...                  | ...                                 |
| 18   | do               | Daniel Cullimore, V.S. ...       | 27 Dec. 1853                       | ...                  | ...                                 |
| 1955 | 28 do            | James McDonald ...               | 14 Feb. 1854                       | ...                  | ...                                 |
| 2    | July             | James Adamson ...                | 1 April                            | ...                  | ...                                 |

| Promoted to<br>Medical<br>Board. | Retired from<br>the Service. | Died,         | Remarks.                        |
|----------------------------------|------------------------------|---------------|---------------------------------|
| ...                              | ...                          | 16 May 1854   | Lost at Sea.                    |
| ...                              | ...                          | 16 May 1858   |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 12 Sept. 1863 |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 2 May 1859    |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 9 Sept. 1859  |                                 |
| ...                              | ...                          | 6 Nov. 1862   |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 19 April 1856 |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 28 Jany. 1861 |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 21 April 1856 |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 6 Mar. 1853   |                                 |
| ...                              | ...                          | 10 Aug. 1859  | Accidentally shot.              |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 29 Oct. 1857  | Do      poisoned by strychnine. |
| ...                              | ...                          | 12 Sept. 1853 |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 7 May 1860    |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 17 Sept. 1857 |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | 23 Dec. 1858  |                                 |
| ...                              | ...                          | 23 July 1855  |                                 |
| ...                              | ...                          | ...           |                                 |
| ...                              | ...                          | ...           | Cashiered, 21st February 1861.  |

| No.  | Date of arrival. | Names                    | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|--------------------------|------------------------------------|----------------------|-------------------------------------|
| 960  | 2 July 1854      | William R. Cornish...    | 1 April 1854                       | ...                  | ...                                 |
|      | 2 do             | Henry Giles ...          | 1 do                               | ...                  | ...                                 |
|      | 25 do            | Samuel J. Wyndowe..      | 24 Mar.                            | ...                  | ...                                 |
|      | 6 Sept.          | John S. Morton, M.D.     | 10 June                            | ...                  | ...                                 |
|      | 6 do             | Ardern H. Beaman...      | 10 do                              | ...                  | ...                                 |
|      | 6 do             | Joseph A. Bean, M.D.     | 10 do                              | ...                  | ...                                 |
| 965  | 7 Oct.           | J. Pearson Nash, M.D.    | 20 do                              | ...                  | ...                                 |
|      | 29 do            | John Shortt, M.D. ...    | 20 Sept.                           | ...                  | ...                                 |
|      | 30 Nov.          | Charles H. Harper...     | 20 Oct.                            | ...                  | ...                                 |
|      | 28 Dec.          | George S. Watson Ogg.    | 12 Sept.                           | ...                  | ...                                 |
|      | 30 do            | Henry C. Brodrick, M.D.  | 2 do                               | ...                  | ...                                 |
|      | 18 March 1855    | William Pearl ...        | 24 Jany. 1855                      | ...                  | ...                                 |
| 970  | 11 Aprii         | George Marr, M. D. ...   | 24 do                              | ...                  | ...                                 |
|      | 26 do            | D. C. McAllum M. D.      | 30 Dec. 1854                       | ...                  | ...                                 |
|      | 26 do            | C. E. P. Johnston ...    | 30 do                              | ...                  | ...                                 |
|      | 26 do            | Edmund E. Lloyd ...      | 24 Jany. 1855                      | ...                  | ...                                 |
|      | 26 do            | Daniel M. Falconer ...   | 24 do                              | ...                  | ...                                 |
|      | 28 do            | Michael C. Furnell ...   | 7 Feb.                             | ...                  | ...                                 |
| 975  | 28 May           | James Augustus Foy.      | 24 Jany.                           | ...                  | ...                                 |
|      | 9 June           | Geo Raymond Trevor.      | 30 Mar.                            | ...                  | ...                                 |
|      | 5 July           | David A. Forbes ...      | 31 Jany.                           | ...                  | ...                                 |
|      | 11 do            | Wm. N. Chipperfield.     | 3 do                               | ...                  | ...                                 |
|      | 7 Aug.           | Henry Webster ...        | 24 do                              | ...                  | ...                                 |
|      | 7 do             | George Dunman ...        | 24 do                              | ...                  | ...                                 |
| 980  | 21 do            | William Doyle ...        | 24 do                              | ...                  | ...                                 |
|      | 21 do            | Richard Watson ...       | 24 do                              | ...                  | ...                                 |
|      | 21 do            | Charles Drew ...         | 24 do                              | ...                  | ...                                 |
|      | 5 Sept.          | George A. Burn, M. D.    | 30 May                             | ...                  | ...                                 |
|      | 21 Oct.          | Thomas Lowe ...          | 24 Jany.                           | ...                  | ...                                 |
|      | 29 Dec.          | Josiah D. Gillies, M. D. | 7 Nov.                             | ...                  | ...                                 |
| 985  | 17 Jany. 1856    | Dugald Campbell, M.D.    | 21 do                              | ...                  | ...                                 |
|      | 19 do            | Richard Arnold ...       | 4 Aug.                             | ...                  | ...                                 |
|      | 8 Feb.           | Thomas Crowdace ...      | 4 do                               | ...                  | ...                                 |
|      | 3 Mar.           | Henry J. H. Griesback    | 4 do                               | ...                  | ...                                 |
|      | 3 do             | Benjamin Hooke ...       | 4 do                               | ...                  | ...                                 |
|      | 3 do             | Robert Dempster ...      | 4 do                               | ...                  | ...                                 |
| 990  | 3 do             | John Houston, M. D.      | 4 do                               | ...                  | ...                                 |
|      | 3 do             | Henry E. Busted ...      | 4 do                               | ...                  | ...                                 |
|      | 3 do             | Henry Crocker, M. D.     | 4 do                               | ...                  | ...                                 |
|      | 3 do             | Hunter Adam ...          | 4 do                               | ...                  | ...                                 |
|      | 3 do             | William H. Morgan...     | 4 do                               | ...                  | ...                                 |
|      | 15 do            | Wm. H. Bourne, M.D.      | 4 Feb. 1856                        | ...                  | ...                                 |
| 995  | 25 April         | B. Williamson, M. B.     | 30 Jany.                           | ...                  | ...                                 |
|      | 14 May           | Henry King, M. B. ...    | 11 do                              | ...                  | ...                                 |
|      | 26 do            | John Stafford Bush...    | 20 Feb.                            | ...                  | ...                                 |
|      | 25 June          | James J. Heffernan...    | 20 do                              | ...                  | ...                                 |
|      | 19 Aug.          | James T. Fraser, M.B.    | 20 do                              | ...                  | ...                                 |
|      | 19 do            | John Groscoret Reed.     | 20 do                              | ...                  | ...                                 |
| 1000 | 19 do            | John Henderson, M.D.     | 20 do                              | ...                  | ...                                 |
|      | 19 do            | Hamilton McErosam        | 20 do                              | ...                  | ...                                 |
|      | 19 do            | James Ridings ...        | 20 do                              | ...                  | ...                                 |
|      |                  |                          |                                    |                      |                                     |
|      |                  |                          |                                    |                      |                                     |
|      |                  |                          |                                    |                      |                                     |

ment, under the Presidency of Fort St. George, up to 1863. 158

| Promoted to<br>Medical<br>Board. | Retired from<br>the Service. | Died.        | Remarks.                                           |
|----------------------------------|------------------------------|--------------|----------------------------------------------------|
| ...                              | ...                          | ...          | Resigned the Service on account of ill<br>[health. |
| ...                              | Feb. 1860                    | ...          |                                                    |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | 31 July 1862 | Dismissed, 31st August 1857.                       |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | 1 July 1857  |                                                    |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | ...          | Dismissed, 31st August 1857.                       |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | 2 Dec. 1859  |                                                    |
| ...                              | ...                          | ...          |                                                    |
| ...                              | April 1860                   | ...          | Resigned the Service on account of ill<br>[health. |
| ...                              | ...                          | 12 June 1861 |                                                    |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | 14 June 1858 |                                                    |
| ...                              | ...                          | ...          | Dismissed, 31st August 1857.                       |
| ...                              | ...                          | 4 Jany. 1857 |                                                    |
| ...                              | ...                          | 12 Nov.      |                                                    |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | ...          | Dismissed, 31st August 1857.                       |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | 22 June 1856 |                                                    |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | 15 Aug. 1857 | Dismissed, 31st August 1857.                       |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | 3 Dec. 1863  |                                                    |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | ...          | Dismissed, 31st August 1857.                       |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | ...          |                                                    |
| ...                              | ...                          | ...          |                                                    |

| Nos. | Date of arrival. | Names.                  | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|-------------------------|------------------------------------|----------------------|-------------------------------------|
| 1010 | 11 Sept. 1856    | James Keesa, M.B. ....  | 4 Aug. 1856                        | ...                  | ...                                 |
|      | 23 do            | Charles Thick Eves...   | 20 Feb.                            | ...                  | ...                                 |
|      | 23 do            | David W. Trimmell...    | 20 do                              | ...                  | ...                                 |
|      | 25 do            | George Bidie, M. B. ... | 20 do                              | ...                  | ...                                 |
|      | 30 do            | Charles A. Andrews.     | 25 April                           | ...                  | ...                                 |
| 1015 | 19 Nov.          | J. M. Donnelly, M. D.   | 3 July                             | ...                  | ...                                 |
|      | 11 Dec.          | Wm. C. Elliot, M. D.    | 4 Aug.                             | ...                  | ...                                 |
|      | 17 do            | Chs. Robertson, M.D..   | 4 do                               | ...                  | ...                                 |
|      | 26 do            | Alex. C. Gamach, M.D.   | 4 do                               | ...                  | ...                                 |
|      | 28 do            | Robert W. Cockerill..   | 4 do                               | ...                  | ...                                 |
| 1020 | 28 do            | Jacob Wilkins, M. D.    | 4 do                               | ...                  | ...                                 |
|      | 10 Jany. 1857    | Robert Wilson, M.D...   | 4 do                               | ...                  | ...                                 |
|      | 31 do            | John B. Newell, M. D.   | 4 do                               | ...                  | ...                                 |
|      | 6 Feb.           | Samuel G. Johnson...    | 30 Sept.                           | ...                  | ...                                 |
|      | 6 do             | Frederick G. Shaw V.S   | 11 Aug. 1860                       | ...                  | ...                                 |
| 1025 | 14 do            | Thomas G. Howell ...    | 12 Nov. 1856                       | ...                  | ...                                 |
|      | 27 Mar.          | Alexander Boggs         | 29 Oct.                            | ...                  | ...                                 |
|      | 25 April         | George E. Whitton, M.D  | 29 Jany. 1857                      | ...                  | ...                                 |
|      | 25 do            | George Western V. S.    | ...                                | ...                  | ...                                 |
|      | 11 May           | James Ross              | 29 Nov. 1856                       | ...                  | ...                                 |
| 1030 | 8 June           | William A. Smith, M.D   | 29 Jany. 1857                      | ...                  | ...                                 |
|      | 8 do             | William F. DeFabeck.    | 29 do                              | ...                  | ...                                 |
|      | 21 July          | Samuel T. Heard, M.D.   | 29 do                              | ...                  | ...                                 |
|      | 13 Sept.         | Thomas Beaumont...      | 29 do                              | ...                  | ...                                 |
|      | 13 do            | William Pierce Kelly    | 9 June                             | ...                  | ...                                 |
| 1035 | 10 Feb. 1857     | Wm. R. Grylla, M.D...   | 4 Aug.                             | ...                  | ...                                 |
|      | 21 April         | James T. J. Doyle ...   | 10 Dec.                            | ...                  | ...                                 |
|      | 10 May           | Henry John Beach ...    | 27 Jany. 1858                      | ...                  | ...                                 |
|      | 6 Aug.           | John M. Miller, M.D.    | 13 April                           | ...                  | ...                                 |
|      | 24 Sept.         | Geo. H. Alexander, M.D. | 28 May                             | ...                  | ...                                 |
| 1040 | 24 do            | William J. Busteed...   | 23 July                            | ...                  | ...                                 |
|      | 24 do            | William F. Davies ...   | 23 do                              | ...                  | ...                                 |
|      | 24 do            | James Welsh             | 23 do                              | ...                  | ...                                 |
|      | 24 do            | Wm. H. Roberts, M.D.    | 23 do                              | ...                  | ...                                 |
|      | 12 Oct.          | David Finlayson ...     | 28 May                             | ...                  | ...                                 |
| 1045 | 31 do            | Charles W. White ...    | 28 do                              | ...                  | ...                                 |
|      | 23 Nov.          | John Murray             | 23 July                            | ...                  | ...                                 |
|      | 25 do            | John Law                | 28 May                             | ...                  | ...                                 |
|      | 18 Dec.          | Walter Fry              | 29 June                            | ...                  | ...                                 |
|      | 30 do            | William Farquhar ...    | 28 May                             | ...                  | ...                                 |
| 1050 | 8 Feb. 1859      | Samuel Rule, M.D. ...   | 23 July                            | ...                  | ...                                 |
|      | 26 Mar.          | J. McDonald Houston     | 23 do                              | ...                  | ...                                 |
|      | 25 April         | Robert E. Pearse ..     | 10 Feb. 1859                       | ...                  | ...                                 |
|      | 8 May            | John Bilderbeck ...     | 10 do                              | ...                  | ...                                 |
|      | 25 do            | Aeneas McLeod Ross.     | 10 do                              | ...                  | ...                                 |
| 1055 | 21 June          | Joseph Dougall          | 10 do                              | ...                  | ...                                 |
|      | 9 Aug.           | Peter W. Marriott ...   | 10 do                              | ...                  | ...                                 |
|      | 9 do             | George D. Riddell ...   | 10 do                              | ...                  | ...                                 |
|      | 9 Dec.           | Charles H. Livingstone. | ...                                | ...                  | ...                                 |
|      | 18 Jany. 1860    | John Fitzgerald ...     | 27 July 1859                       | ...                  | ...                                 |
| 1060 | 18 do            | Spencer Meredith ...    | 27 do                              | ...                  | ...                                 |
|      | 28 do            | Joseph F. Barter ...    | 27 do                              | ...                  | ...                                 |
|      | 20 Feb.          | Andrew Fergusson M.D    | 27 do                              | ...                  | ...                                 |

ment, under the Presidency of Fort St. George, up to 1863. 160

[illegible]

| No.  | Date of arrival. | Names.                  | Date of Rank as Assistant Surgeon. | Promoted to Surgeon. | Promoted to Superintending Surgeon. |
|------|------------------|-------------------------|------------------------------------|----------------------|-------------------------------------|
|      | 20 Feb. 1860     | Hugh Griffith, M.D. ... | 27 July 1859                       | ...                  | ...                                 |
|      | 2 Mar.           | Francis T. Bayntun...   | 26 Oct.                            | ...                  | ...                                 |
|      | 9 do             | Benjamin T. Suffrein.   | 27 July                            | ...                  | ...                                 |
|      | 28 do            | George Williamson, MD   | 20 Jany. 1860                      | ...                  | ...                                 |
| 1065 | 23 April         | Wm. Turnbull M.D. ..    | 20 do                              | ...                  | ...                                 |
|      | 5 June           | Francis O. B. Wither    | 25 do                              | ...                  | ...                                 |
|      | 10 July          | Daniel Kearney ...      | 20 do                              | ...                  | ...                                 |
|      | 15 do            | Chs. Robert G Parker.   | 20 do                              | ...                  | ...                                 |
|      | 20 Sept.         | Hugh R. Handyaide MD    | 20 do                              | ...                  | ...                                 |
| 1070 | 8 May 1861       | Fred. Duckworth, M.D.   | 1 Oct.                             | ...                  | ...                                 |

**ART. VI.—*Annual Report of Triplicane Dispensary, Madras, for the year 1862.* By Native Surgeon MOODEEN SHERIFF, Graduate Madras Medical College.**

(Communicated by the Principal Inspector General, Medical Department.)

I AM happy to state that my professional engagements with people of all kinds in the 4th District have been very successful; particularly with Mahomedans, who resort to my treatment not only from all parts of the Presidency, but also from distant places situated along and near the Madras Railways such as Vellore, Arcot, Vaniembady, Amboor, &c.—a fact, which does not fail to prove the highest imation in which the English medicines are now held by many natives, and the extent to which their benefit has been diffused amongst them.

Besides this, there is reason to believe that the English medical science itself is introduced to some extent into the Mahomedan community at Madras. I allude to the fact that, since my appointment to this Dispensary, now 4½ years ago, about 10 young hakeems have benefitted from my professional instruction, and although the knowledge they have thus acquired is very imperfect for many reasons, yet they appear to have learnt enough to live upon, and to gain confidence of many of their fellow countrymen, who have frequently engaged their services.

A few more have also applied lately to be allowed to place themselves under my instruction, but I do not intend to comply with such requests in future, unless they apply to the medical authorities, and obtain permission to be instructed

| Promoted to Medical Board. | Retired from the Service. | Died.        | Remarks.                      |
|----------------------------|---------------------------|--------------|-------------------------------|
| ...                        | ...                       | ...          | Cashiered, 23rd October 1863. |
| ...                        | ...                       | ...          |                               |
| ...                        | ...                       | ...          |                               |
| ...                        | ...                       | ...          |                               |
| ...                        | ...                       | ...          |                               |
| ...                        | ...                       | 16 June 1860 |                               |
| ...                        | ...                       | ...          |                               |
| ...                        | ...                       | ...          |                               |
| ...                        | ...                       | ...          |                               |
| ...                        | ...                       | ...          |                               |

by me. Should they succeed in this, I am willing to give them a course of lectures in their own language on some of the most useful branches of the medical science, till they are competent to practice the profession they wish to pursue.

The number of out-door-patients treated by me during the last year in the Triplicane Dispensary was 16,264. Many of these patients were not able to come to the Dispensary on account of the severity or nature of their sickness, and were consequently attended by me in their own quarters, being supplied with medicines from the institution through their friends, and they were chiefly the females and children of the poorer class of people living at Royapettah, Triplicane, and Mylapoor. Among the wealthier inhabitants of these places, I have also had many under my treatment, but as they all purchased their own medicines from private Dispensaries in the Presidency, they are not included in the above number.

My duty in the Hospital of the Triplicane Dispensary under Surgeon Major Porteous is instructive and advantageous to myself, and I have received every encouragement and assistance, from that gentleman, calculated to promote my interest in both public and private affairs.

The following are a few of the interesting medical and surgical cases I had under my treatment during the year.

#### CASE 1.—SECONDARY SYPHILIS.

Mr. G. M., *Æt.* 31.

26th July 1862.—I was directed by Mr. Porteous to attend upon this gentleman. He had two long standing syphilitic ulcers on the right side of his face, one on the forehead,



and the other a little above the upper lip, both being covered with a thick dirty yellowish scale, and having an elevated copper colored base. The nose, which was also coppery, was painful and swollen on the right side with slight and superficial ulceration in its lining membrane, and the septum was almost completely destroyed by former ulceration. The soft palate and fauces were congested, and there were very large and painful nodes and swellings on both legs and feet.

The patient was weak with an unhealthy syphilitic appearance, and bore several marks of old ulceration on his face and extremities. He was first affected with primary syphilis in 1856, and had been since repeatedly attacked with its secondary and tertiary symptoms. He had undergone a trial of all the remedies generally in use for venereal diseases.

I put this gentleman at once on the use of *Liquor Hydrargyri Bichloridi* with bitters, and continued it till the end of September, increasing the dose of the solution gradually from 3i. to 3iv. three times a day; the nose was at the same time syringed out daily with Zinc lotion, and the sores on the face touched freely and frequently with Tincture of Iodine. Under this management the ulcers of the face and nose were healed and the patient was freed from all symptoms, except the nodes and pain in the legs. For these, it was necessary to have recourse to several other remedies, including electricity, vesicants, and preparations of Iodine. Of all these the use of electricity was most beneficial. It relieved the pain instantly (though but temporarily) whenever it was employed, and its influence over the nodes in diminishing their size was very rapid and satisfactory, and they had nearly disappeared when I saw him last about the middle of November.

The long course of the solution of Bichloride of mercury in this case had no effect whatever on the salivary glands, and the only disagreeable symptom experienced by the patient while taking the largest dose prescribed for him, was an uneasy sensation about the throat and stomach, and even this only for a day or two shortly before the medicine was discontinued.

#### REMARKS.

There is much truth in the practical remarks made by Dr. Waring in his most useful work on *Materia Medica*, page 242, that "It is more difficult to produce salivation by corrosive sublimate than by any other salt of mercury; in-

deed Mr. Clay (Lancet, 21st August 1841) states that in an experience of 20 years, though he has pushed it to a great extent, both in adults and children, he has never been able to produce decided pytalism by its use." The above case may be taken as an example, and I am also aware of several others in my own practice and in that of my immediate superior, Mr. Porteous, (in the venereal wards of the Triplicane Hospital) in which the medicine has been used to a great extent and with great benefit, but without the production of the least tendency to pytalism. The occasional occurrence of this effect under the use of Bichloride of Mercury is, however, unquestionable, but it is so rare in comparison to the number of the patients treated, that the medicine may generally be said to exercise its therapeutical influence without producing salivation or any sensible evacuation, and it is, therefore, an alterative in the strictest sense of its meaning.

The use of electricity in this case is the next point of practical interest. Its beneficial influence over the pain and nodes, particularly the latter, was very great and encouraging, and it deserves a further trial.

#### CASE II.—PSOAS ABSCESS.

C. M's wife, *Æt.* 30.

1st May 1862.—I was requested by one of the chief and respectable native practitioners at Madras, "Surlushker Khan Bahadloor," the present hakeem of the Begum of His late Highness the Nabob of Carnatic, to see a Mahomedan lady at Mylapoor, who had been attended by him unsuccessfully for some months. Her previous history was, that she had been, for about eight months before our visit, subject to an occasional pain in the back, which was like that of rheumatism, and which subsequently became fixed in the loins on the left side of the spine. It was considered to be owing to a diseased condition of the left kidney, and the patient was treated for it on a few occasions with temporary and partial relief. Five months after that period, she observed a swelling in the lower part of her abdomen a little above the left groin (iliac fossa), attended with pain, fever, &c., and this prevented her from walking about. In a short time more, this swelling became very painful, and increased rapidly till it attained the size and condition I found on my visit, which was as follows—

There was great swelling on the right side of the abdo-

men, extending from the hypogastric region to the loins across the left iliac region. It was accompanied with very severe pain, and some discharge of purulent matter from the uterus. The left thigh was much drawn towards the body, and any attempt to extend it put the patient to great agony. She was only able to lie on her right side, and there were bed sores about the hip joint. There was no fluctuation in any part of the swelling, nor was I able to detect any pain in the spine, except on its left side, in the loins as low down as the crest of the ilium.

As the patient was extremely emaciated, I was able to feel that the swelling was connected with the uterus, this view was confirmed by the discharge of pus from that organ being much increased by firm pressure over a prominent part near the anterior superior spinous process of the ilium.

Stimulants, tonics, and anodynes, with leeches, fomentations, and injections into the uterus were used, but without much avail, until the abscess had pointed; it was opened in the loins a little above the middle of the crest of the ilium. From that moment the matter ceased to flow from the uterus, and the patient gradually recovered.

#### REMARKS.

Any collection of matter in the soft parts attached to the spine is generally known, according to the course it takes and the situation where it points, under the names of lumbar, psoas, or iliac abscesses. The abscess in the foregoing case was so extensive and complicated, that it was characterized by almost all the symptoms that are present in each of these three varieties. Its origin was that of an iliac abscess; the pain in the back and loins being followed by a swelling first in the iliac fossa, where it was more prominent than any other affected parts; and it resembled a lumbar abscess in having terminated by pointing in the loins. In all other respects it was strictly a psoas abscess.

When the psoas muscle is affected to any extent, the first thing that leads to the suspicion of that disease, is the flexion of the thigh, which cannot be extended or moved in any direction without causing a great pain to the patient; and if this condition of the limb is accompanied with pain, swelling, and other signs of accumulation of matter in any part about the pelvis, groins, &c., it is considered to be a reliable indication of the existence of psoas abscess. All these

symptoms were very well marked in the above case, and I have, therefore, placed it under the head of that disease.

The extension or communication of the abscess with the uterus in this case, although somewhat strange, cannot be wondered at, when we know, as Druiitt says, that "sometimes it reaches so low as the knee; sometimes passes backwards to the nates; sometimes through the pelvis and sacio-sciatic notch to the nates; and sometimes it has discharged itself through the bladder or rectum."

### CASE III.—HEPATIC ABSCESS.

Gahea Bee, *Æt.* 28.

25th June 1862.—Through the same hakeem, "Surlashker Khan Bahadoor," I had the opportunity of attending on this case, which, although having proved fatal, is yet by no means less interesting than the preceding one.

The patient in this case was said to have been suffering for a long time with pain and swelling in the right side, and during the previous year these symptoms became so much aggravated that she was confined to her bed for some months before I saw her. The patient had great pain in the right side, which was much enlarged, the swelling extending from a point on a level with the nipple to a little below the crest of the ilium; and there were present all the symptoms of hectic fever in addition to those of the irritability of stomach and bowels, with dyspnoea and cough. There was a distinct but deep fluctuation in the centre of the swelling near the margins of the ribs, but there was neither bulging of any particular spot, nor pitting on pressure, or any other sign of adhesion of the tumor to the abdominal parieties.

Stimulants with opium.

Fomentations and warm poultices to the part.

Broth and conjee for diet.

Early in the next morning, her husband brought to hospital a large quantity of thick yellowish white fluid in a bottle, saying that it was what she voided through the urethra a few minutes before he left her, and that she had frequently and copiously passed the same kind of fluid during the night. He added that the swelling was much diminished, and the patient had had a more comfortable night than for several previous months. The fluid was detained till it was seen by Mr. Porteous, and on examination it

was found to be urine mixed with a larger quantity of thick purulent matter.

I visited her about 11 o'clock, and was surprised to find the enlargement reduced to half its size, and she was in a much easier condition. To satisfy myself more on this point, I caused a vessel to be cleaned and made her void her urine in it, while I was standing behind a wall, and the fluid passed was exactly of the same nature as that brought to hospital.

From this time, the matter continued to pass more or less with the urine, and although the patient was much relieved from the pain and swelling, yet all other symptoms (except cough and dyspnoea) remained unaltered, and to these was added irritability of the bladder, and the patient died in the beginning of August.

Besides supporting the system with stimulants, tonics and nourishing diet, and relieving other symptoms with opiates, astringents, &c., the only remedies employed for the cure of the abscess were derivatives in the shape of blisters. A seton was proposed, but the patient would not submit to its use.

#### REMARKS.

Although an examination of the body was not obtained, yet it is pretty clear from the symptoms and progress of this case, that the patient was suffering from an hepatic abscess, which, judging from the extent of the swelling, must have been very large; and the whole of the abdominal and thoracic viscera on the right side of the body were more or less effected from its pressure. The kidney appears to have been involved in the suppurative action, and through the pelvis or ureter of this organ, the abscess emptied itself into the bladder, whence the matter was discharged through the urethra. The great diminution of the side, and relief of the patient from pain, dyspnoea, &c., immediately after the evacuation of pus, cannot be accounted for in any other way than I have explained. It is not certain to what extent the kidney was affected, but from the large size of the swelling in the lumbar region it is probable that it was wholly implicated. The course of the abscess in this case is certainly of a very unusual kind, and I am aware of only one instance of such an occurrence on record.

With regard to the treatment, the question is, was it advisable or not, to open the abscess under the circumstances

in which I found the patient on my first visit ? I believe it was not, because the signs of adhesion between the abscess and the wall of the abdomen, which is the most indispensable condition in operating on hepatic abscesses, were completely wanting ; and, as a rule, until we are quite certain of their existence, we are not to open an abscess in the liver under any condition.

#### CASE IV.—SPINAL PARALYSIS.

Munsoorooddoulah Bahadoor, *Æt.* 50.

*24th April 1862.*—I was desired to attend upon this native gentleman, who was reduced to the last degree of emaciation, and had been confined to his bed for several months previously. He was suffering from paralysis of the whole body, excepting the head, and there was a partial but distinct loss of sensation in all the extremities. The loss of power of motion was greatest in the lower half of the body, the patient not being able to stand, even with support, and the only control he had over his lower extremities, was to move his feet to the extent of a few inches, when lying on his bed. He was able to move about his arms slightly, but there was a complete inability to close his hands, with some contraction or rigidity of fingers. He complained of constant pain in the back and in other parts of the trunk, with occasional shivering or rigors. This pain was said to have been the chief symptom from the commencement of his sickness about six or seven months before my visit, when it was attended with very severe fever, rigors, &c., and extended from the trunk to both the extremities. The joints were quite normal, without any swelling, thickness, pain, or tenderness on pressure. There was neither any paralysis about the face, nor any other symptom of structural or functional derangement of the brain.

On pressure and percussion along the spine, pain and tenderness were complained of, along its whole length, particularly in the lumbar and sacral regions. Pulse weak and frequent ; skin warm and dry ; bowels irregular ; urine scanty and high colored, and there was no palsy in the bladder.

The disease in this case was considered to be rheumatism, by all the hakeems that had attended upon the patient, and he was treated for that disease without the least suspicion

of paralysis up to the moment he placed himself under my care.

*Treatment.*—The spine from the nape of the neck to the apex of the sacrum was blistered or rather excoriated repeatedly by applying a very strong alcoholic solution of Iodine (Iodine 3i. Pot. Iodid : 3ii., Alcohol 3i.) every day for the first week, and then every 2nd or 3rd day for two weeks more. Medicines to improve the general health by giving tone to the system and restoring the function of skin, kidneys, bowels, &c. were used at the same time.

On the 4th day of treatment (27th April) the report is, "already some change for the better in the movement of the limbs. The patient himself thinks he is improving. The spine is slightly blistered in some places, and excoriated in others, that is much complained of by the patient." In fact I found the very day I was applying the solution of Iodine for the second time, that there was some restoration of action in the paralysed muscles.

On the 6th day of treatment (29th April) there was "no pain on pressure in the spine, except that from the application of medicine." Within a short time more, the patient was much improved, being able to stand up, with support, and walk a few steps; and in every respect appeared to be in a fair way of his recovery. After this he was kept for a long time under the use of strychnine, tonics, &c., with the free use of turpentine and Pearson's liniment externally; and he was made also to exercise frequently by getting up and walking about with assistance.

In the month of August, he was directed for change of air, to go and live in one of his gardens, near St. Thomas' Mount, where I saw him last, and found him able to get up and walk about to a little distance without any assistance.

#### REMARKS.

The paralysed condition of the limbs in this case was so distinct, that it is astonishing how it escaped the notice of the hakeems and was mistaken for rheumatism. They seem to have fallen into this error on account of the severe and general pain the patient was subject to; but this, as we know, is also an occasional symptom of paralysis, and cannot therefore be depended upon by itself in forming a diagnosis of rheumatism. If there was any doubt in the nature

of this case, it ought to be this, was the palsy in this case rheumatic, cerebral, or spinal? If the latter, to what extent was the spinal cord affected, and was it affected alone?

It was not a rheumatic paralysis, for it will be seen from the case, that there was no sign whatever of rheumatism, except the pain, this pain being accompanied, besides the palsy and other symptoms of spinal disease, with rigors, it was apparently the result of spinal meningitis. Dr. Hooper, while describing the symptoms of acute inflammation of the membranes of the spinal cord, says "the pain, which often closely resembles that of rheumatism, and is brought on, or increased, by motion, extends along the back, and to the limbs, which are sometimes painful to the touch; or it shoots around the abdomen or chest. Rigors are also sometimes present." This accounts satisfactorily for the characters of the pain in the preceding case.

The absence of facial paralysis and other cerebral symptoms on the one hand, and the presence of pain on pressure in the spine, on the other, leave no doubt that the palsy in this case was owing solely to a diseased condition of the spinal cord; and the immediate relief of all the symptoms by the use of counterirritation to the vertebral column alone is another fact greatly in favor of the above opinion. With regard to its extent, it is apparent from the pain on pressure all along the spine, and from the extensive loss of both motion and sensation, that the whole cord was in a state of inflammation, and the existence of a similar condition in its coverings was indicated by the characters of the pain and rigors, as already explained.

The disease in this case was evidently acute at the beginning, but subsided gradually into chronic form; and judging from the considerable period it had lasted before my treatment, it is probable that there was also some effusion into the spinal canal, though there was no direct evidence of its existence. It was partly from this notion, and partly to keep up a constant, undisturbed, and less painful irritation for a long time, that I adopted the use of the solution of Iodine instead of blisters.

Iodine, perhaps, is the only medicine that has the combined influence of counter-irritants and deobstruents, when used externally in the shape of strong solutions; its good effects in this case were more than could have been reasonably expected. It is chiefly from its use, that the patient



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who was despaired of his very life, is now in the enjoyment of good health and fit for the ordinary duties of his position.

The number of Coroner's Inquests attended by me during the year was 32, as follows:—

|                                                |    |
|------------------------------------------------|----|
| Cases of drowning                              | 18 |
| Cases of accidental death from injuries, &c... | 6  |
| Cases of natural death from organic diseases.  | 5  |
| Cases of snake bites                           | 3  |

Total... 32

The following is the list of minor operations performed during the year:—

| Disease.                                      | Nature of operation.                        | No.  | Cured. | Relieved. |
|-----------------------------------------------|---------------------------------------------|------|--------|-----------|
| Abscesses, buboes, & boils.                   | Opened, generally by a bistory              | 813  | 813    | 0         |
| Anthrax ... ..                                | Crucial incision                            | 19   | 19     | 0         |
| Ascites... ..                                 | Tapped                                      | 5    | 0      | 5         |
| Cystic tumor ... ..                           | Removed by dissection                       | 2    | 2      | 0         |
| Dislocation of elbow joint.                   | Reduced                                     | 2    | 2      | 0         |
| Do of shoulder do                             | Do                                          | 3    | 3      | 0         |
| Do of hip do                                  | Do                                          | 3    | 3      | 0         |
| Foreign body in nose, ear, and pharynx ... .. | Removed                                     | 32   | 32     | 0         |
| Fracture of bones of forearm ... ..           | Set with hot splints and starch bandages... | 15   | 15     | 0         |
| Fracture of humerus...                        | Do do                                       | 1    | 1      | 0         |
| Do of ribs ... ..                             | Broad bandage                               | 1    | 1      | 0         |
| Do of scapula ... ..                          | Figure of 8 bandage                         | 1    | 1      | 0         |
| Do of femur ... ..                            | Long splint                                 | 2    | 2      | 0         |
| Do of tibia & fibula.                         | Splints and starch bandage.                 | 1    | 1      | 0         |
| Hernia ... ..                                 | Reduced by taxis                            | 9    | 0      | 9         |
| Hydrocele ... ..                              | Tapped and injected                         | 17   | 17     | 0         |
| Do ... ..                                     | Tapped                                      | 125  | 0      | 125       |
| Phymosis ... ..                               | Circumcised                                 | 7    | 7      | 0         |
| Polypus nasi ... ..                           | Removed                                     | 6    | 6      | 0         |
| Stricture urethræ ...                         | Catheter used                               | 27   | 19     | 8         |
| Total.                                        |                                             | 1091 | 944    | 147       |

## PART II.

### REVIEWS AND NOTICES OF BOOKS.

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*The Science and Practice of Medicine.* By WILLIAM AITKEN, M. D., Edin.; Professor of Pathology in the Army Medical School. Second Edition. Revised and re-written. London: Charles Griffin and Company.

THE new edition of Professor Aitken's *Science and Practice of Medicine* has met with a most cordial reception from the profession at home, teachers, busy practitioners, and students. A careful examination of the work has convinced us that this flattering reception is well deserved, for rarely, in the exercise of our critical functions, have we found our task more agreeable. Dr. Aitken's book professes to be a second edition, but, in point of fact, it is almost entirely a new work, for it has been re-written on a greatly extended plan; it is in two volumes of very unequal size, printed in a large, clear type, and, "agreeably to facts and doctrines set forth in the second volume of the Ophthalmic Hospital Reports, on paper of a yellowish hue;" busy men will learn with satisfaction that the index at the end of the 2nd volume is more complete than is to be found in any professional work with which we are acquainted.

Dr. Aitken's book does not profess to be merely a record of his own observations, for, although it is rich in original matter, much more so than a superficial reader would suppose, the latest views of the best authorities, on all the subjects of which it treats, are given. To enable him to do so, our author has shrunk from no labour, to each workman due honour is given, the smallest contribution to the general stock of knowledge is generously acknowledged; and although he has ranged over a wide field and laboriously collected an immense amount of information, the book is far from being a mere compilation, for so thoroughly has the author digested and assimilated his intellectual food, that even where he is not original, his descriptions have all the freshness of new matter.

The 1st Part treats of topics relative to Pathology. The student entering on the study of the Theory of Physic will

find in the 10 chapters devoted to this comprehensive subject, the key-note of the whole treatise. We earnestly commend these chapters to the careful study of our young native and East Indian students; they will find in them general principles of scientific medicine, which, once mastered, will prove the surest antidote to that fatal tendency to routine in practice, which is the besetting sin of their class. The seventh chapter of this part treats of Fever-Pyrexia. Unless we are greatly mistaken, there is much in this admirably written chapter which will be quite new to many of our readers. We suspect that many of our busiest practitioners in this country are not aware how valuable an aid both for diagnosis and prognosis the thermometer is. The time has come when this instrument will be as much in the hands of the practical physician as the stethoscope. Following Wunderlich, and his colleague Professor Parkes, our author goes most fully into this subject, and lays down data relative to the temperature of the body, as a guide to the pathological value of regularly continuous thermometrical observation in the diagnosis and prognosis of disease where fever may be present. We trust that a careful study of this section will lead many of our readers to make careful thermometric observations, not only on the fevers of India, but also in many other acute diseases; such observations are anxiously looked for by pathologists in Europe.\*

The section on Inflammation will be found to contain the latest investigations of physiologists. It is followed by a full description of the Degenerations of Tissue. As we might expect from so prominent a pathologist, nothing can exceed the clearness of the description given of these degenerations, of these at present the most interesting and important is what is now known as Amyloid or Albuminoid degeneration. The following is Dr. Aitken's description of tissues which have undergone this degeneration. "The cut surface  
 " of an organ so affected has a semi-transparent appearance.  
 " It feels like a piece of soft wax, or of wax and lard combined.  
 " It cuts into portions of the most regular shape, with sharp  
 " angles and smooth surfaces; and the thinnest possible  
 " slices may be removed by a sharp knife, for microscopical  
 " examination. They are abnormally translucent. Water  
 " and alcohol, acids and alkalies do not produce any change  
 " upon the transformed parts, which may be kept for a

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\* We before directed attention to this and the next named subject, and refer our readers to our remarks in Vol. V., p. 198, of this Journal.—ED. M. Q. J.

“ length of time without decomposition. The organs affected are increased in volume, in solidity, and in weight, absolute and specific. Anæmia is predominant; but the colour of blood or of healthy tissue shines through the semi-transparent morbid substance. Amyloid degeneration is generally widely diffused; so much so, that a constitutional state of ill-health seems associated with its production; and in cases preceded by a local disease, such as caries of a bone, the degeneration may be found in the adjacent lymphatic glands. This is the earliest appearance of the degeneration yet recognized.”

“ The small vessels of the tissue—the more minute arteries in particular—are, as a rule, the first structures attacked. The coats of the arteries become thickened and granular, and at last pellucid, transparent, and hyaline. Their calibre is reduced, and their cut section remains patulous.

\* \* \* \* \*

“ When a solution of iodine is brought in contact with the affected part a very deep violet-red colour is produced; and this deep red colour seems to be *alone* a sufficiently characteristic test; especially when, in a few seconds, the colour increases in depth from the moment it takes effect. It is a re-action which ensues between the solution and the morbidly degenerate part. The best solution is composed as follows:—Twelve grains of Iodine is to be dissolved with twenty-four grains of Iodide of Potassium, and mixed with three ounces of water. Such a test solution ought always to be at hand in the dead house, or on making a post-mortem examination.”

Dr. Aitken follows up his description by some observations on the clinical history of, and on the signs or symptoms associated with, this remarkable degeneration. The whole section devoted to this subject will repay attentive study, and as this degeneration is much associated with the malarious cachexia, it is common enough in this country, although it has been described by Indian pathologists under other more familiar names.

Part II. opens with a chapter on the Nomenclature and Classification of Diseases, in which the subject is treated in a philosophical and practical spirit. Although well aware of its defects, Dr. Aitken, with certain exceptions, follows the classification of Dr. William Farr, “ because it is at present practically the most useful Nosology; because its *nomen-*

clature has been agreed upon as that to be used by the War Office authorities of our own country, and in the Medical Returns of Her Majesty's British and Indian Armies," and for other reasons given in the text.

Part III. treats of Zymotic Diseases. To the description of the various diseases is added a diagram representing the typical range of temperature. This is the first time that anything of the kind has been introduced into a text-book on Medicine, and we hail the innovation as one of the most useful in the book. Dr. Aitken is a convert to the non-identity of typhus and enteric fever, and on no part of the work has more pains been bestowed than on the account of these two affections.

The chapter on the Pathology of the Parasitic Order of Zymotic Diseases is one in which the industry and research of the author appear to great advantage. We believe that all that is known of this rather repulsive but still important subject will be found in this section, which it is impossible to read without a shudder. The reader derives some sort of consolation from the reflection that the bodies of our numerous tormentors are themselves infested by parasites which, we charitably hope, cause them as much discomfort as we suffer from the formidable looking creatures described and figured by our author.

We have only to add that in no systematic work with which we are acquainted, are tropical diseases treated with such ability and fulness as in that before us, and we conclude with a hearty expression of thanks to Dr. Aitken for his valuable contribution to medical literature, and a hearty recommendation to our readers to add this excellent work to their libraries.

*Practical Lithotomy and Lithotrity; or an Inquiry into the best modes of removing Stone from the Bladder.* By

HENRY THOMPSON, F. R. C. S. of University College; Consulting Surgeon to the St. Marylebone Infirmary, &c. &c.

London: John Churchill and Sons, 1863—8vo. pp. 274.

It is the fate of practitioners in India to hear of new Medical books long before they have an opportunity of seeing them; and when we first heard of the above work, we felt inclined to place it in the list—a tolerably large one—of

*made books*; for we conceived that all the information it was likely to contain would certainly be found in most of the many admirable general Surgical treatises which we possess. A careful perusal of Mr. Thompson's work has satisfied us of the incorrectness of our first impression, and has convinced us that, notwithstanding the great attention which has been paid to the removal of stone from the bladder by European Surgeons during many generations, there are still points open to discussion, and that Mr. Thompson has done good service by entering upon their consideration.

There can be no doubt that the introduction of Lithotrity into Surgical practice has had a very considerable influence in modifying the views of the modern Surgeon, as to the universal applicability of the lateral operation of Lithotomy. And further than this, it has led to a far more accurate diagnosis, to a closer study of the peculiarities of individual cases, with the result of applying to each its most appropriate treatment. As our author says:—

"It is believed to be neither philosophical nor politic to apply to every stone, whether it be no bigger than a nut or as large as an apple, invariably one and the same proceeding. We have learned the importance, in the first place, of ascertaining, before deciding on any operation, the physical character of the stone; that is, as regards its size and hardness; and secondly, the condition of the patient in relation to the state of his urinary organs and his general susceptibilities."

The work embodies the Lettsomian Surgical lectures of the Medical Society of London, for 1862. But as the limits of the course only permitted the delivery of a portion of the matter prepared, the author determined upon publishing the whole in its original form. And, perhaps, of all modern Surgeons, Mr. Thompson is peculiarly qualified, by his studies, for the task which he has imposed upon himself, for his name has, for some years, been intimately associated with the Pathology and Surgery of the male urinary organs, and his skill and success as an operator are beyond dispute.

The scope of the work may be gleaned from the following extract from the preface:—

"The sole object of this work is to present a consideration of the best operative procedures now in use for the removal of stone from the bladder of the male patient. These will be described, with a view not only of enforcing those broad principles which are pretty generally, though, perhaps, not always sufficiently recognized, as necessary to guide the Surgical student, but of furnishing many use-

ful practical details, which a considerable experience and careful observation of varied schools alone can supply.

"An exposition of these, it is believed, may prove not without value in relation to Lithotomy, and to some debated questions in connection with it ; while some important considerations, bearing on the operation of Lithotritry, will, it is believed, be discussed here for the first time. Lastly, the various modes of operating will be compared, and their merits discussed, with a view to determine the relative scope and applicability of each to the numerous and varied exigencies which are presented by calculous patients. The principles so deduced will be exemplified in practice by the recital of cases from my own experience selected for illustration."

Our author divides his work into twelve chapters. The various operations of Lithotomy are described in the first four chapters. The fifth treats of the causes of death after operation ; and the sixth of the difficulties and dangers met with in Lithotomy. The next four chapters are devoted to a minute detail of the present practice of Lithotritry. The eleventh is headed, "On the choice of proceedings best adapted to different cases;" and the last consists of brief reports of illustrative cases.

The first four chapters contain a full detail of all the operations which have been devised for the removal of stone by incision. The third is especially devoted to a description of the various operations performed in the central portion of the perineum. Our author includes five varieties of central operation :—Dupuytren's bilateral, which possesses characters which refer it distinctly to the central group ; Civiale's medio-bilateral, which, as Mr. Thompson says, "although now upwards of thirty years old, appears to be unknown in this country ;" the Italian or median method, known as Allarton's ; Buchanan's operation with the angular staff ; and the recto-vesical operation.

In the introductory remarks to the description of these operations, Mr. Thompson takes the opportunity of impressing upon his readers that the dissection to be made is a *surgical* and not a *minute anatomical* one—that supposed anatomical requirements must not be permitted to alone engage the attention to the exclusion of the physiological or vital points. Our author says :—

"During the last fifty years especially, there has been a growing conviction that incisions made in the side of the perineum are attended by serious dangers, which may be avoided by incisions limited to the centre.

"First, it has been believed that severe hæmorrhage is less likely to follow incisions in the centre than in the lateral division of the perineum, because the great vessels lie in this latter portion, provided further that the median incisions do not much involve the bulb.

"Secondly, it has been believed that the capsule of the prostate is less likely to be divided, and consequently that the cellular interspaces between the pelvic viscera are less likely to be opened by incisions in the centre than on one side only of the perineum.

"Unquestionably it must be agreed by all, that the anatomical necessities of the region, if alone considered, demand that, in the preliminary incisions of all Perineal Lithotomy, central or lateral, the operator should avoid the upper and outer parts of the perineal space, and that he should confine the deep ones within the limits of the prostate gland. But there is another necessity, *not an anatomical but a vital one*, less obvious, possibly, to the casual observer, but not a whit less urgent and with which the former must be reconciled, viz. :—the important fact that the internal opening must be sufficiently free to admit the instrument and the stone to pass without the exercise of so much force as to hazard the destruction of the tissues at or about the neck of the bladder. It is the clashing of these two opposed considerations, the vital and the anatomical, which will probably, always maintain a difference of opinion and practice in Lithotomy. One school will be most influenced by the dangers to which anatomy demands attention. Another school will be most impressed with the injury which the tissues suffer when incisions have been unnecessarily limited. The difficulty is to reconcile them ; to find precisely the safe medium of action. It must vary in different cases ; and the knowledge and judgment of the operator must decide the question in each."

There is abundant evidence in the work before us that the author belongs to the second of the two schools which he describes, for his pages contain frequent references to the importance of the vital considerations.

In speaking of Lithotomy as applied to children, Mr. Thompson says that the lateral operation is generally, and no doubt correctly, held to maintain its superiority over other methods ; but both the median and the medio-bilateral are admissible. And concerning the risk attendant upon free internal incisions, he says :—

"A lateral section carried beyond the limits of the prostate, which is an extremely small organ at this period of life, is almost free from danger, since it is beyond all question necessarily practised in almost all infantile cases, while the death-rate among them is not



more than half what it is in adult age, when such sections are usually regarded as attended with the greatest risk."

He urges the employment of one knife only in operating on children; for an exchange of the scalpel for the broken knife exposes to the risk of finding difficulty in placing the beak of the second knife in the incision made by the first, and thus of missing the groove of the staff altogether.

Mr. Thompson next describes the suprapubic operation, which is rarely performed for other than very large stones, and mostly in adults. He quotes Dr. Murray Humphry of Cambridge, to the effect, that "the dangers of the high operation do not increase in so great a ratio with the size of the stone as in the lateral operation;" and mentions that Dr. Humphry performed this operation successfully upon a boy of fourteen years of age. The present writer witnessed this operation, and can testify to its success, for the stone was a very large one, and was removed without any great difficulty, and within a month of the day of operation he saw the lad walking about the garden of the hospital, stating that he was quite well.

The fifth chapter, on the Causes of Death, deserves a very careful perusal. Our author points out that:—

"Nothing can be more deceptive than a method of dealing with the results of Lithotomy, whether numerically or otherwise, by which cases of all ages are treated indiscriminately in one category. The causes of death are not the same in adult life and in the period of youth; indeed, they vary so much as to render a separate consideration of them necessary."

He first considers the causes of death in the adult. The first, and, beyond all doubt, the most frequent, cause is, acute inflammation of the tissues, especially of the loose cellular tissue around the neck, base, and sides of the bladder; always of a destructive character, and generally with a tendency to invade other parts. This inflammation may be the result of—

1st. Mechanical violence inflicted in the removal of the stone, and this especially in the attempt to drag the calculus through an insufficient opening. To quote our author's own words:—

"I am persuaded that insufficient internal incisions are equally dangerous with those that are too free, and that the tendency of the present day is towards the former extreme. The purely anatomical view of the subject appears just now in the ascendant. The vital

attributes and dispositions of the organs involved are not sufficiently regarded."

He insists upon the fact that infiltration does not necessarily follow free internal incisions in the adult, but acknowledges that the latter render the former more likely to occur. But the danger is always great in a ratio proportioned to the size of the calculus; but this arises quite as much from the violence inflicted in removing a large stone as from the depth of the incisions employed.

2nd. Death may result from rapidly-spreading inflammation produced by urinary infiltration into the cellular interspaces between the pelvic viscera when they have been opened up by too deep incisions.

Mr. Thompson believes that this result occurs much less frequently than is generally supposed. He considers that in most cases the effect has been mistaken for the cause; that cellulitis, produced by violence, has first destroyed the connective tissues, and the urine has then infiltrated the disintegrated tissue and intensified the inflammatory action.

3rd. Neither of the above-named causes being present, fatal cellulitis may occur; as in unhealthy subjects, or where erysipelas is present.

Secondly.—Inflammation of the mucous membrane of the bladder, spreading to allied vital organs, may lead to death after Lithotomy.

Thirdly.—Death may happen from absorption into the system of poisonous products derived from the urine.

Fourthly.—From phlebitis and pyæmia; unfrequent, however, in comparison with other fatal issues.

Fifthly.—From shock; also a rare termination.

Sixthly.—From hæmorrhage and exhaustion;—never perhaps from primary hæmorrhage, but rather from the exhaustion attendant upon continuous and oft recurring bleeding.

Lastly.—From tetanus; an extremely rare event.

The causes of death in children differ widely from those which are met with in adults.

Peritonitis, by no means common in the adult, is the most frequent cause of a fatal issue in children, and constitutional exhaustion is nearly as frequent. Mr. Thompson considers that there are three reasons why Lithotomy is much less

fatal in the child than in the adult. 1st,—The rudimentary condition and want of special sensibility of the sexual organs. 2nd,—The vigour of the processes of growth and repair in childhood. And 3rdly,—The position of the bladder in children favors the continuous discharge of urine and of all noxious secretions after operation.

The chapter upon the Difficulties and Dangers met with in Lithotomy contains a very careful account of all the exceptional circumstances which may embarrass the surgeon in the performance of the operation. There is less of what is new in this chapter, for, of course, the materials for it have been drawn from the experiences of many.

We have occupied so much space in drawing attention to the more salient points of interest and novelty in the first part of this work, that we are unable to do more than just refer to the excellence of the second part, which treats of Lithotrity. Until very recently so few precautions were taken against injury to the parts concerned, that mechanical violence to the bladder and urethra at the time of operation, and irritation from the presence of fragments and during their subsequent repulsion, led to such serious disasters as to bring Lithotrity into undeserved disrepute.

We are therefore not surprised to find that Mr. Thompson expresses his intention of not describing the operation of even ten years ago, but rather the Lithotrity of to-day, a safer and a better operation.

To give an outline of these chapters would be almost useless. We should not be doing justice to either our author or our readers if we attempted an epitome of them. We must refer those desirous of knowing the principles and practice of modern Lithotrity to the work itself, in which they will find them fully exposed with all necessary detail. Every condition of success, every procedure connected with the practice, is carefully and accurately described.

To the practitioner in Southern India, where calculous affections are exceptional, it may appear to be somewhat a matter of indifference whether or no he possesses an accurate acquaintance with the details of the operations designed for the removal of stone; but we hold that it is the duty of every surgeon to achieve such an education—using the word education in the fullest sense of the term,—as to render him capable of treating not only the ordinary exigencies, but also the exceptional cases that may come before him.

And we have no hesitation in saying that no one can be believed to be thoroughly acquainted with all the considerations bearing upon the subject of the removal of stone, either by cutting or crushing, until he has mastered Mr. Thompson's treatise. To every surgeon who now has a case of stone under his care, we would earnestly recommend a perusal of our author's chapter "On the choice of proceedings best adapted to different cases," which is perhaps one of the most valuable portions of this very valuable work.

The work is beautifully printed and got up, as are all the Messrs. Churchill's publications; it is sufficiently illustrated by 82 well executed wood cuts; and it is published at a very moderate price.

In conclusion, we can only repeat that the volume before us is of a most instructive character; that its teachings may be relied upon as thoroughly trustworthy; that it is the most complete work upon the subjects of which it treats, so far as we are acquainted; and that it is the only treatise, with which we have met, in our language, which contains a full and accurate account of the principles and practice of the art of Lithotrity.

It cannot fail to add to the already well merited reputation of its author.

*The Principles of Medicine.* By HUKHEEMS BAKUR ALI SAHIB and SYED ALI SAHIB. Licentiates of the Hyderabad Medical School. Madras: GRAVES AND COOKSON, United Scottish Press—1860. Rl. 8vo. pp. 575.

WE hail in this work a valuable addition to medical literature in one of the vernaculars of Southern India. It is a large octavo volume, of five hundred and eighty five pages, of good paper, printed in clear and well-defined Hindustani type, strongly and neatly bound.

The book is partly a composition, and partly a compilation, based upon C. B. Williams' *Principles of Medicine*, J. Hughes Bennett's ponderous tome with a similar title, and the works of other medical celebrities; but its arrangement is due to Dr. George Smith, who may see in this highly creditable publication the outline of a course of his lectures, amplified

and filled in by two of his most distinguished pupils. In the woodcuts the reader will recognize copies of those found in Dr. Bennett's Principles and Practice of Medicine, and these copies are fair imitation, furnished by élèves of Dr. Hunter's School of Arts.

The alumni of the Hyderabad Medical School and of all kindred institutions, where Hindustani is the language used as the medium of instruction, will find in the volume before us a valuable text-book, treating the subjects it embraces in a condensed practical manner, and, with all the light of the most recent discoveries in science. We are glad to see that throughout the book English scientific terms have been retained, although in almost every case, the technical term is followed by an explanation. Such words as *prognosis*, *diathesis*, *pathognomonic*, &c., do not admit of accurate translation into a language of such limited scope as Hindustani, and their retention was, therefore, a necessity. To the English reader it looks passing strange to see words like *electricity*, *cirrhosis*, *bruit-de-soufflet*, *endosmosis*, and many others, too numerous to mention, given in the Persian character, but we can congratulate the editors, and Dr. Smith and Moonshee Shaik Ali Munsubdar, on the extraordinary correctness which distinguishes their phonetic representations of scientific, and often sesquipedalian terms! We are not qualified to criticise the style of writing in the work under review, but if simplicity and intelligibility be criterions of excellence, it presents those qualities to a remarkable degree, and much of the credit of this is due to Shaik Ali Munsubdar, whose knowledge of English, and zealous co-operation in the preparation of the manual, were of material assistance to the editors and also to Dr. Smith, who, more than once, revised the entire manuscript, prior to its publication.

The passing of this work through the press has been, to our certain knowledge, a task entailing no small amount of trouble and requiring the exercise of not a little patience. Two years and a half elapsed between the date when the manuscript was placed in the printer's hands and the appearance of the printed volume; and though Dr. Smith's absence from the country may have been the chief cause of this delay, many other circumstances, which it is needless to specify, contributed to it. The delay, however, would have been still more protracted had not Mr. Edward Balfour kindly revised and corrected the proofs of the first half of the book as it passed through the press.

A few translated extracts will suffice to show the quality of the information conveyed in the work. The first we shall give is a short section describing certain alterations in the quality of blood-fibrine :—

“Alterations of blood-fibrine take place under various circumstances. For example, in certain diseases, such as some specific inflammatory and scrofulous affections and the different varieties of cancer, the fibrine becomes deteriorated. On this account, when effused, it is found to be something peculiar, neither genuine, fibrine nor albumen, but something between these two, although it bears a greater resemblance to albumen. As this material is unfit for purposes of normal nutrition, and incapable of forming a healthy web of tissue, it is called *caco-plastic* or lymph of inferior quality.

“And in those conditions in which the constitution is rendered infirm and enfeebled from syphilis or the excessive use of mercury, the fibrine of the blood becomes changed for the worse, and in this state, if any part be wounded or otherwise injured, the fibrine effused is imperfect, like pus or buttermilk or water, so that the wound cannot be closed up nor healed, and no web of tissue can be formed by it. Such material is called *aplastic*, or such as is altogether incapable of organization.

“*Treatment.*—Often deterioration of fibrine is the result of deterioration of the blood generally. On this account, in its treatment, medicines capable of purifying the blood, such as diaphoretics, and stimulants, and purgatives, and alteratives, like the iodide of potassium, and tonics, like the preparations of iron and cod-liver oil, and quinine, &c., and good food should be given, and change of air prescribed. Chlorate of potash also may be exhibited, because in every eight parts there are one of chlorine, one of potash, and six of oxygen; and this excess of oxygen serves to render the blood pure, arterial, and perfect, and promotes also the elaboration of fibrine. In the treatment of this condition the inhalation of oxygen gas may also be tried; but this subject is still under investigation; and as the inhalation is both difficult and inconvenient, recourse is had to chlorate of potash, nitric acid, and other remedies, into the composition of which oxygen largely enters.”

The following paragraph briefly, but adequately, indicates the varieties of inflammation, and it is succeeded in the original by several others describing particularly the leading features of each variety. Of the latter, however, we can find space for only two :—

“There are several varieties of inflammation, and each variety has its own name. For example, when inflammation runs high, and the vital powers of the part affected with it are vigorous, it is called *sthenic* or strong inflammation; and when the reverse occurs, it is termed

*asthenic* or weak inflammation. It is necessary to distinguish between these two, because the one is entirely opposite to the other. When the progress of inflammation is rapid, its duration short, and its intensity great, it is called *acute*; but when its progress is slow, its duration protracted, and its intensity moderate, it is called *chronic*. The appropriateness of these two terms is evident enough, but, besides them, there is another, *sub-acute*. The signification of *sub* is inferior, so that whatever inflammation is less than acute, and occupies an intermediate position between acute and chronic, is so called.

"Some authors would seem to apply the designation *sub-acute* to any inflammation which is more like acute inflammation in its intensity, and *chronic* inflammation in its duration; while others regard even its intensity as less than that of *acute* inflammation; so that the exact meaning of the term is not definitely fixed, but continues doubtful. When the usual accompaniment of inflammation *congestion*, runs high, they call it *congestive* inflammation; and when there is an increased determination to one spot more or less limited, the inflammation is said to be *phlegmonous*. And then there are different varieties of inflammation, characterised by various impurities and alterations of the blood. When inflammatory action spreads very rapidly, it is called *erysipelatous*; and when upon the inflamed surface a thin web is formed, it is styled *pellicular* inflammation. When it is accompanied by passive hæmorrhage, they call it *hæmorrhagic*; and when it is strumous in character, it is termed *scrofulous*. If produced by the admixture of poisonous matter with the blood, it is known by the designation of *specific*, of which *rheumatic* and *gouty* inflammations are examples; and when it proceeds from *syphilis* or *gonorrhœa*, they call it *syphilitic* or *gonorrhœal* inflammation.

"*Sthenic inflammation*.—This inflammation is well-defined in its character. It occurs in constitutions, the powers of which are sound and vigorous, and their health robust. The fibrine of the blood is increased, inflammatory fever severe, the heart's action violent, the pulse strong and full, and whatever matter is effused is enplastic. This condition is distinguished by a marked toleration of antiphlogistic remedies, and recovery generally results.

"*Asthenic inflammation* is the opposite of the former. It is imperfect and weak in character, because the powers of the body are enfeebled, and the health below par; the quality of the blood is depraved and changeable, its fibrine and nutritious material being reduced in quantity. Whatever matter is effused is sometimes caco-plastic and at others aplastic, and there is less tolerance of antiphlogistic remedies. On this account it is necessary in such cases to use antiphlogistic measures with great caution. In India this variety of inflammation is most frequently met with, especially among the poor.

Our next extract is taken from the last division of the work, which is entirely occupied with the subject of Hygienics. We give the chapter on Clothing *in extenso*, and only regret that time and space forbid our transcribing all the chapters of this part of the book, which well deserves to be reprinted as a tract calculated to prove eminently useful to the Mahomedan community, among whom it should be extensively distributed.

*" On Clothing.*—For the protection of the human body against cold and heat, sunshine and rain, clothing is necessary, because man's skin is fine and soft and smooth, and he is not provided like inferior animals with some natural covering, such as hair, feathers, and scales. The cause of his not being similarly protected is, that a merciful God has bestowed upon him a mind, by the exercise of which he can fabricate clothes to protect his body, while to inferior animals the deity has merely given instinct, which cannot help them to provide their own clothing. They are, therefore, provided with a natural protection—some with feathers, others with scales, others with hair, and others with a very thick skin.

*" Clothing should be regulated according to climate, whether hot or cold, because in very cold countries, warm clothing is necessary for the maintenance of the natural heat of the body, and of the circulation of the blood, and other bodily functions. In warm countries, men's vestments should be both less and lighter, and this rule, to clothe according to the temperature of a place, accords best with our natural inclination. Accordingly, the inhabitants of cold countries encase themselves in leathern, woollen, and other warm garments, while the people of warm countries adopt such as are made of silk or cotton. And whatever kind of clothing may be necessary in any country, in that country such clothing is found. For example, wool and similar materials in cold climates, and in warm ones cotton and such like commodities. And though inferior animals are unable like men to clothe themselves according to the varying temperature of a country, a bountiful Creator has endowed their bodies with a specially suitable provision for their protection. To those which inhabit very cold countries he has given a thick layer of fat below their skin, in order that no injury should accrue to them or to the functions of their bodies, and that their natural heat should be maintained. And in those more temperate climates, where cold is sometimes considerable, and at other times much less, England for example, inferior animals are not provided with an increase of fat to the same degree, but their skin is thick and hair long and woolly. In the winter especially it grows longer, but when the cold decreases it becomes finer and shorter; and if such animals be brought to a warm country, their wool falls off, and hair alone remains; while the animals of warm countries not only have not the same amount*



of fat, but their hair also is not so long, as there is no necessity for it.

“With the difference of clothing in every country according to its temperature, we find a corresponding difference in the customs of its inhabitants. In northern and very cold climates, people not only wear leather garments, but, with the exception of apertures for the nostrils and eyes, cover up the whole body, because if any part remain exposed, disease would be engendered by the intensity of the cold, even to the extent of the ends of the fingers, and the nose, and the ears falling off in mortification! Such a custom in this country would occasion much surprise! In warmer climates, except the face and the hands, they cover the whole body, because if it be exposed and the air find access to its entire surface, some disease or other, such as inflammation of the lungs, catarrh and other maladies might be produced. Besides, in cold countries, people protect their feet against cold to the best of their ability, because if cold be applied to the feet, inflammation of the lungs or of the liver may result. On this account even the strongest always wear stockings and shoes which are closely fitted to the feet. Such as are able wear Indian-rubber in the soles of their shoes as a still better protection. Their clothes also are worn tightly fitted to the body that the cold and sharp wind may not reach it. In warm countries, they do not wear their garments tight but loose, so as to hang apart from the body and allow the air to reach it.

“In cold climates if the air reach the throat and neck, quinsy and inflammation of the lungs and consumption may result, on which account it becomes necessary to wear neckerchiefs. Should an inhabitant of Hindcostan go to England, it would be necessary for him also to wear a neckerchief, and in such cold countries the protection of the chest also is essential. Hence people there wear a tight shirt of flannel, or linen, because, if the chest be exposed to the air, diseases such as consumption and inflammation of the lungs are produced.

“In warm countries it is expedient to protect the head and the stomach, for if the head be uncovered and exposed, disease of the brain often follows. Accordingly by the action of the sun and heat, headache and insolation are produced, while catarrh, &c., follow the application of cold. Dysentery and other diseases result from the operation of cold or heat on the belly, especially at the change of seasons. On this account the people of this country generally, to the best of their power, avoid exposure of their head and their bellies, always covering the former with a turban and surrounding the latter with a cummer bund.

“It is requisite to regulate one's clothing according to season also. In the warm season, thin cotton or silk garments may be worn, but these should give place to clothing larger in quantity and of thicker material in cold weather. Especially when the season is changing, for ten or twelve days, special care is required to protect the body

with adequate covering, and when the rainy season commences, non-exposure of the belly and the feet is particularly advisable.

Inferior animals also, according to seasons, undergo certain changes. In winter their fat becomes increased, and their hair long and thick, while during the hot season the reverse occurs. Clothing should also be regulated according to age. In infancy and old age it should be such as to afford increased protection to the body, because in those two periods of life there is a greater susceptibility of injury from cold and wind, especially during the changes of seasons. At both the forementioned periods, it is desirable that the garments should not fit tightly, as injury is likely to result from tightly fitting vestments. The careful clothing of children accordingly to season and temperature, especially at the time of taking them out into the open air, is essential to the preservation of their health, and their protection from cold and cough and other diseases of the chest and abdomen.

During convalescence from disease also, the body should be guarded with adequate clothing, since in that condition of weakness and feebleness it is particularly liable to be injured by cold and wind.

"It should be remembered that attention to clothing is necessary in the treatment of diseases as well as for the preservation of health, inasmuch as many maladies, such as affections of the chest and abdomen, and rheumatism, &c., are very much aggravated by cold."

Looking at the volume before us as the work of two young Hindustani physicians only just out of their pupilage, we are bound to express unqualified admiration of the zeal, industry, and ability they have displayed, as well as to congratulate the Minister, Mooktear-ool-Moolk Salar Jung, on the success with which his wishes have been carried out by two of his own *illagudars* or dependents. We say *his* wishes, as the publication of the work originated in a suggestion of the Minister himself. In June 1859, he communicated with the then Residency Surgeon, Dr. Smith, regarding "the compilation of a book on the Sciences of Medicine, taught at the Hyderabad Medical School, founded on the notes of the students, and superintended by Dr. Smith." The importance of the proposition was at once recognized by the officer addressed, who forthwith replied that "though labour and patience would be required to prepare a complete and correct set of text books, on the subjects taught in the school, yet that few real difficulties were in the way." These few difficulties have been so far overcome, that the first of the proposed series has appeared, but we fear the removal of Dr. Smith to another sphere of duty, renders the appearance of the whole series somewhat unlikely.

The original purpose was a grand one, but like many another in this country may fail of accomplishment, if the principal agent, precluded from continuing his labours, is followed by others on whom his mantle does not fall. The "Principles of Medicine" must, for the present, be regarded as the solitary, though highly creditable, representative of what was intended to be a most useful series of text-books. It is the commencement of a scheme, which we would be glad to see completed as it has been begun.

We cannot refrain from contemplating the volume on our table as an index of the quality of the education in the Hyderabad Medical School. Both the kind and the extent of the instruction furnished there are disclosed in the pages of this text-book, and we are glad to notice rather an advance than a retrogression in these respects on the antecedent period, when the able founder of the school, Dr. Maclean, for eight or nine years laboured, and laboured successfully as its head and sole teacher! That two of the *alumni* of the institution should be able, so soon after completing their own curriculum of study, to publish for the benefit of succeeding pupils so full and complete a manual, speaks well for the high education and high standards distinguishing the medical school where they were taught. And similar success must always mark the history of medical schools whose standards are equally high.

We point to the Grant Medical College of Bombay and the Medical College in Bengal, as institutions whose scholars frequently achieve distinction even in the Colleges of the United Kingdom; and not more than five years ago the same could have been proudly stated of the College in this Presidency. But can this be said now? We fear not. And if not, whence the difference, save in the depression of the standard of education!

Of all the learned professions, that of medicine, from the repellent nature of one of its initiatory branches of study, requires most fostering and most encouragement. To treat its *aspirants* with the cold shade of indifference or neglect, is virtually to bar the profession against them, and to place the vocation of the medical man at a positive disadvantage. But is it not worse than mere indifference or neglect, is it not even a mockery, to invite students to a medical curriculum shorn of its fair proportions, so that when they have completed their course of study here, they find

themselves still in the back-ground, with attainments inferior to those of the élèves of other Colleges in India, and even below the requirements of their own University?

We write in the interests of a noble institution, whose staff of Professors are well qualified to place it in the vanguard of medical schools in this country! We write, too, in the interests of Government, which needs not only thoroughly efficient recruits for its subordinate medical ranks, but also highly educated medical practitioners to occupy at less cost to the State positions which imported physicians will not fill without high emoluments! And we write also in the interests of the public, who have a right to expect that the men entrusted with their health and their lives, should be in every respect equal to this responsible charge.

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*Report of the Commissioners appointed to enquire into the Sanitary State of the Army in India, with Precís of Evidence. Parliamentary Blue book. EYRE and SPOTTISWOODE. London: 1863—8vo. pp. 265.*

*Report of the Commissioners, Precís of Evidence, Minutes of Evidence; Addenda. (Vol. I.) Quarto, pp. 944.*

*Reports from Stations in India and its dependencies occupied by British and by Native Troops; Reports of Inspectors General of Hospitals; Reports on Stations in Ceylon. (Vol. II.) Quarto, pp. 955.*

FOR the above valuable aids to a complete knowledge of the Sanitary condition of the Army in India, we are indebted to the Government of Madras and the Adjutant General of the Army.

To attempt a detailed notice of the contents of them would be, at present, premature—but we desire to lay before our readers three extracts which will sufficiently indicate the instructions conveyed to the Commissioners, and the conclusions at which they have arrived, relative to the present state of Sanitation in Military Barracks, Hospitals and Cantonments, and, as to the best means of ensuring greater comfort, improved health, and freedom from disease of Europeans in India.

The following were the instructions issued by Her Most Gracious Majesty to the Commissioners, and we may add that to the first named of them, the lamented Lord Herbert, we are in great part indebted for the institution of this enquiry the results of which are calculated, we earnestly hope, to prove of incalculable benefit to the British soldier serving in this tropical climate.

#### COMMISSION.

*“Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith.*

*To Our right trusty and well-beloved Councillor, the Right Honorable Sidney Herbert, and to Our trusty and well-beloved Robert John Hussey Vivian, Knight Commander of the most Honorable Order of the Bath, a Major General in Our Indian Forces, and a Member of the Council of India; Proby Thomas Cautley, Knight Commander of the most Honourable Order of the Bath, a Colonel in Our Indian Forces, and Member of the Council of India; Thomas Alexander, Companion of the most Honorable Order of the Bath; Edward Harris Greathed, Companion of the most Honourable Order of the Bath, a Colonel in Our Army, William Farr, M. D., James Ranald Martin, Esq., and John Sutherland, M. D., greeting.*

*Whereas it hath been humbly represented to Us that, considering the great importance of maintaining and improving the Health of all ranks of Our Army serving in India, it is expedient that certain Inquiries should be made.*

*Now know ye, that We, having taken into Our Consideration the premises, do hereby order and direct you, the said Sidney Herbert, Sir Robert John Hussey Vivian, Sir Proby Thomas Cautley, Thomas Alexander, Edward Harris Greathed, William Farr, James Ranald Martin, and John Sutherland, to inquire firstly, into the Rate of Sickness and Mortality, and Invaliding among our Troops, both of the General and Indian Services, in all stations throughout India and its Dependencies; and into the class of Diseases from which such Sickness and Mortality arise.*

*And, further, We do order and direct you to inquire into the Causes of such Sickness and Mortality; whether as relates to Climate, Locality, State of Barracks, Drainage, Water Supply, Diet, Drink, Dress, Duties, or Habits of Troops.*

*And, further, We do order and direct you to inquire into what existing Stations are unhealthy, and to indicate how such unhealthiness may be removed, if possible, and the nature of the Sanitary Improvements required.*

*And, further, we do order and direct you to inquire into the subject of the Healthy Positions, generally with the view of recommend-*

ing the most healthy for future Occupation, and of ascertaining whether healthy Stations may not be found within moderate Distance of such existing unhealthy Stations as may be of Political or Military Importance ; also into the general subject of Sanitaria and Hill Stations, with the view of pointing out the most healthy Positions on them.

*And*, further, We do order and direct you to inquire as to the best Construction of Barracks, Huts, Hospitals and Tents for India.

*And*, further, We do order and direct you to inquire into the present Regulations or Practice for preserving the Health of the Troops, and enforcing Medical and Sanitary Police.

*And*, further, We do order and direct you to inquire into the present Organization of the Army Sanitary and Medical Service.

*And*, further, We do order and direct you to inquire as to the Practicability of establishing a general system of Military Statistics throughout India, and to ascertain whether any, and what means exist, of comparing the Diseases and Mortality of the Troops with those of the Civil Population, English and Native.

*And*, We do further command and require you to Report what Changes you may consider it expedient to make in the present Practice, with respect to any of the Subjects above mentioned.

*And*, it is Our further will and pleasure that you, or any Five or more of you, do obtain Information touching the Matters aforesaid, by the Examination of all Persons most competent, by reason of their Knowledge, Habits, or Experience, to afford it ; and also by calling for all Documents, Papers, or Records, which may appear to you, or any five or more of you, calculated to assist your Researches and to promote the formation of a sound Judgment on the subject, and that you, or any five or more of you, do report to us under your hands and seals, your several Proceedings by virtue of this Our Commission, together with your opinions touching the several matters hereby referred for your consideration.

Given at our Court at St. James's this Thirty-first day of May, in the year of Our Lord one thousand eight hundred and fifty-nine and in the Twenty-second of our Reign.

By Her Majesty's Command,  
(Signed) STANLEY."

The reply to the instructions conveyed in the foregoing is now before us. Nearly four years of patient enquiry had to elapse before the Commissioners were in a position to report fully upon the sanitary condition of the army in India, and the voluminous documents now submitted to us prove that they have spared no exertion in their endeavours to acquire the fullest and most reliable information.

It is our intention on this occasion merely to quote the "*Recapitulation*," or summary of these conclusions, as to the state of affairs as disclosed in the evidence submitted to them, and the "*Recommendations*" which they offer as to the best means of remedying existing evils and permanently ameliorating the sanitary condition of, not only the army but of, the people at large.

Before submitting these important passages (the pith and substance of the report) we note with sorrow that the deaths of Lord Herbert and Dr. Alexander, and the unavoidable absence of Sir Robert Vivian (formerly Adjutant General of the Madras Army) deprived the Commissioners of the continued aid of these valuable coadjutors, whose places were filled by Lord Stanley, as Chairman, and Colonel Durand and Dr. Gibson, (Director General Army Medical Department) as Members.

Under the signatures of the Commission, thus reconstructed, we receive the following.

#### RECAPITULATION.

Our inquiry has shown—

1. That by far the larger proportion of the mortality and inefficiency in the Indian army has arisen from endemic diseases, and notably from fevers, diarrhoea, dysentery, cholera, and from diseases of the liver.

2. That the predisposition to these diseases is in part attributable to malaria, in conjunction with extremes of temperature, moisture, and variability.

3. But that there are other causes of a very active kind in India connected with stations, barracks, hospitals, and the habits of the men, of the same nature as those which are known in colder climates to occasion attacks of these very diseases, from which the Indian army suffers so severely.

In examining into these causes, we find that the stations generally have been selected without reference to health, and mainly from accidental circumstances, or for political and military reasons. Many of them are situated in low, damp, unhealthy positions, deficient in means of natural drainage or on river banks, close to unwholesome native cities or towns.

The towns and bazaars in the vicinity of lines are in the worst possible sanitary state, undrained, unpaved, badly cleansed, often teeming with offensive and dangerous nuisances ;

Bad selection of Stations.  
Bad Sanitary state of Native Towns and Bazaars.

with tanks, pools, and badly made surface gutters, containing filth and foul water ; the area overcrowded with houses, put up without order or regularity ; the external ventilation obstructed, and the houses overcrowded with people ; no public latrines, and every spare plot of ground covered with filth in consequence ; no water supply, except what is obtained from bad shallow wells and unwholesome or doubtful tanks. These towns and bazaars are the earliest seats of epidemics, especially of cholera, before their ravages extend to the European troops in the vicinity.

Sanitary defects of Stations. None of the stations have any subsoil drainage ; and there are no other means of removing the rainfall except surface gutters.

The ground about the lines is often broken up in pits and hollows, filled with stagnant water, or it is traversed by unwholesome ravines or nullahs. In certain states of the weather and wind nuisance is experienced in the lines from these causes, and from the foul state of neighbouring native dwellings. Many of the older stations are irregularly built ; and the buildings are arranged so as to interfere with each other's ventilation.

Both barracks and hospitals are built at or close to the level of the ground, without any thorough draught between the floors and the ground. And the men, both in barrack rooms and sick wards are exposed to damp and malaria from this cause, as well as from want of drainage.

Defects in construction of Barracks and Hospitals. The ventilation is generally imperfect ; and from the arrangement of doors and windows, men are exposed to hurtful draughts. Many of the rooms are too high, and as a consequence there is much surface over-crowding, both in barracks and hospitals, although with large cubic space. In a number of instances both the space and area per bed are much too small.

Overcrowding. Barracks and hospitals have frequently no glazed windows, and only wooden shutters. Both barrack rooms and sick wards are, as a rule, dark.

Want of light. There are often four, or even six, rows of beds between the opposite doors or windows, increasing greatly the already existing difficulty of ventilation and exposing the inmates to foul air.

Bad position of beds.



The greater proportion of the force is lodged in barracks in such large numbers per room as to be very injurious to health ; many of these rooms being several hundreds of feet in length, and some of them containing from a quarter to half of a regiment each !

Water sources have been, with one or two exceptions, selected without analysis, although it is always hazardous to omit this precaution. The supply is taken from shallow wells and tanks, both of which are very liable to pollution. In a few cases, the water is derived from rivers. It is drawn by dipping, and carried in skins, thereby increasing its impurity. No precaution are taken for purifying drinking water, and the whole arrangement result in a supply of water (for drinking and culinary purposes) of a bad or doubtful quality, and such as would be rejected in any improved sanitary district in this country. This unsatisfactory condition of the water supply is one of the cardinal defects at Indian stations.

Ablution and bath accommodation is often very deficient and sometimes there is none. Very often there are no baths, and where baths exist there are not enough.

Means of cooking are primitive and imperfect, hardly suitable for permanent barracks, although the cooking is considered sufficiently varied.

Privies and urinals are generally of a bad or defective construction. The contents are removed by hand, often producing great nuisance. No drainage for either privies, ablution rooms, or cook houses : the foul water is received into cesspits or carried away by hand.

Hospitals are constructed on the same general plan as barracks. They have no proper ablution or bath accommodation ; no water-closets, only open privies situated at a distance ; no drainage, no water supply, except what is drawn and carried by hand labour. The bedsteads are often of wood, instead of iron, and mattresses and pillows of various materials, instead of hair, as they ought to be. No trained attendants are provided for the sick.

The soldier has a complete ration of good quality ; but the ration is not varied to provide against the effects of soldiers' sedentary habits ; and no difference is made for the cold and hot season. For the hot season the ration contains too much

animal food and too little vegetable. Mutton is not issued often enough.

Flannel under-clothing would be very advantageous, and a better system of supplying boots for troops is required.

The use of spirituous liquors is highly detrimental to the soldier's health in India, and is one of the chief personal habits which injure him physically and morally. Abstinence from

**Drink. Intemperance.** spirits has always been attended by greatly improved health even under circumstances otherwise unfavorable, and by diminution of crime. The only advantage of the issue of spirits in canteens is stated to be that it prevents the soldier from obtaining more unwholesome spirits in the bazaar. The moderate use of malt liquor or light wines is much less injurious to health than spirits.

Connected with habits of intemperance and want of occupation, is the prevalence of syphilis, a disease which occasions a large amount of inefficiency and invaliding.

Means of recreation are few, of exercise none, of instruction limited. The soldier's habits are sedentary where they ought to be active. He is led into vice and intemperance. He has no means of occupying his time profitably. He complains of the weary sameness and ennui of his life. This, together with his diet, and allowance of spirit and malt liquor, is bad for his health. Physical as well as moral health.

Making every allowance for the influence of climate, which, however, is altogether secondary, except as increasing the effect of removable causes of disease, the whole tenor of the evidence proves that the bad sanitary conditions enumerated, together with unfavorable habits as to diet, intemperance, and want of occupation, on the part of the men, are causes sufficient to account for a large part of the sickness, mortality, and invaliding occasioned by those diseases from which the army in India mainly suffers.

The arrangements for the prevention of disease are either non-existent or most deficient. There are no proper sanitary authorities in towns, no trained officers of health in any town or cantonment, and no means whereby the experience obtainable in dealing with sanitary questions at home can be rendered available for India. Until recently, no means on the part of Medical Officers of receiving education in military hygiene and sanitary knowledge existed; there was no recognition of the sanitary element

in the Army Medical Service. At present there are no means of bringing trained sanitary knowledge or experience to bear on the selection of sites for stations, or on the laying out of stations or bazaars with the requisite sanitary works, or on the planning or construction of barracks and hospitals on sanitary principles.

Under the new Medical regulations, medical officers are empowered to make representations regarding removeable causes of disease to commanding officers, which will so far meet the requirements of regiments ; but otherwise there is neither order nor system in sanitary administrations.

Hill stations are proposed as a means of being able at once to remove the troops from the influence of climate malaria, and sanitary defects of stations and barracks into a

healthy region. The evidence proves that these stations are usual chiefly for prevention, but not always for cure of disease ; that they are suitable for children, and for healthy or ailing men, but not for unhealthy regiments, especially those suffering from bowel complaint ; that about a third part of the troops might be located on hill stations, or on other high and healthy positions in rotation, with advantage to health ; that although the number of stations in malarious regions should be diminished as far as practicable, and the troops removed to healthier localities, there are certain strategical points (yet undecided) which must be held, whether healthy or unhealthy, and the force on the hills must be considered as a reserve for the purposes of health.

Although several excellent hill stations are in use, they are not sufficiently convenient for many stations ; and an increased number is required. Very careful examination and trial of the climates of new sites should be undertaken. The evidence farther shows that there has been great neglect of sanitary measures at existing hill stations, giving rise to serious disease and mortality.

Stations on the plains and slopes of India up to 1,500 feet, and on the raised coasts of the sea, are comparatively salubrious. They only require adequate sanitary arrangements.

Lowland Stations. Stations on low inundated lands are hotbeds of malaria. Native lines are laid out, and huts built, without sufficient reference to health.

There is no drainage, clearing, or levelling, and little attention to cleanliness or ventilation.

Native hospitals are almost altogether wanting in means of personal cleanliness or bathing, in drainage or water supply, in every thing in short, except medicine. The Medical Officer has no con-

trol over the patients' diet. There are no trained attendants on the sick. The evidence shows that, by management and conciliation, much might be done to improve the sanitary condition of native lines, as well as the state of native hospitals.

We have, in the course of our inquiries, endeavoured to ascertain the probable excess of mortality in the Indian army occasioned by the sanitary defects we have described, as well as the reduction of mortality which would follow on the adoption of improvements in existing stations, combined with the use of hill stations, and the abandonment of as many unhealthy localities as may be practicable. The statistical evidence shows that the mortality varies from 11½ per cent. in the most unhealthy, to about 2 per cent. in the most healthy places, even in their present unimproved state. It has been estimated that the lowest of these rates, or 2 per cent., (double the rate at home stations since the introduction of sanitary improvements,) may be taken as the possible mortality under improved sanitary conditions.

The annual death rate for the whole of India has hitherto been about 69 per 1,000. The proposed European establishment is 73,000 men, and will, at the present rate of mortality, require 5,037 recruits per annum to fill up the vacancies caused by death alone.

A death rate of 20 per 1,000 would require only 1,460 recruits per annum, so that the excess of mortality is 3,570 lives per annum.

Estimating the cost of recruiting, training, and landing men in India at no more than 100*l.* per man, the excess of mortality will be equivalent in cost to a tax of nearly 1,000*l.* per diem, irrespective of the cost of the extra sickness indicated by a high death rate.

A careful examination of the causes of disease and of the character of the diseases prevalent at the more healthy stations, would lead us to hope eventually for a greater saving of life than we have here estimated. Causes of disease, such as exist at these stations, would, even at home, be sufficient to account for one-half of the 20 per 1,000; and if the times should ever arrive when, under the influence of improved culture, drainage, and sanitary works, India should be freed from the local malaria which exists every where there now, as it once did in some form or other over Europe, we may cherish the hope of realizing what statistical inquiries appear to point to, namely, that the natural death rate in times of peace of men of the soldiers' ages in India, will be no more than 10 per 1,000 per annum.

But a reduction of mortality also indicates increased physical strength and greater fitness for duty in the army generally, as well as a smaller proportion of "constantly sick" in hospital; and hence a greater effective numerical strength.

Fewer recruits would be required to supply the losses from disease, a point of very great importance, in regard to which Sir A.

Tulloch states that he very much questions whether, with the mortality rate of the last 40 years, it would be possible to keep up an army of 70,000 men in India. And he says that from what he knows of recruiting, this country would not be able to fill up the gaps occasional by death, and at the same time supply the vacancies occasioned by invaliding, and by the return of time-expired men.

Apart therefore from the question of humanity, the introduction of an efficient system of hygiene in India is of essential importance to the interests of the empire.

The following recommendations are founded on the practical conclusions at which we have arrived.

#### RECOMMENDATIONS.

1. That no recruit be sent to India under 21 years of age, nor until he has completed his drill at home, and that recruits be sent direct from home to India, so as to land there early in November.

2. That no spirits be issued to troops on board ship, except on the recommendation of the Medical Officer in charge.

3. That the sale of spirits at canteens be discontinued, except in specific cases on the recommendation of the Medical Officer, and only malt liquor or light wines allowed. That the sale of spirits in Military bazaars be made illegal, and, as far as practicable, suppressed.

4. That the ration be modified to suit the season ; that flannel be introduced as under-clothing, and a better system of supplying boots introduced.

5. That the means of instruction and recreation be extended to meet the requirements of each station. That covered sheds for exercise and gymnastics be provided, and that gymnastic exercises be made a parade. That libraries be improved, a better supply of books and periodicals provided, together with reading rooms, well lighted at night. That only coffee, tea, and other non-intoxicating drinks be sold to the men at these rooms. That workshops be established, and also soldiers' gardens, in connexion with the station, wherever practicable. That the proposal made by Sir Charles Trevelyan of selecting and educating soldiers of good character for subordinate offices in the administrative departments be tried.

6. That until the mortality be reduced, the period of service in India be limited to ten years.

7. That provision be made for passing invalids at the port of embarkation without delay, and for their immediate shipment home.

8. That works of drainage and water-supply be carried out at all stations. That all existing water sources be subjected to analysis, and those rejected which contain matters injurious to health

That the present method of drawing and distributing water be discontinued wherever practicable. That all water used for drinking purposes be filtered, or otherwise purified.

9. That all future barracks and hospitals be erected on raised basements, with the air circulating under the floors, and that, in all existing barracks and hospitals, the floors be raised as much as possible, and a free current of air allowed to pass beneath them.

10. That all new barracks be constructed to hold no more than a quarter company in each building, or at most half a company in one building in two separate rooms having no direct communication with each other. That hospitals be constructed in detached pavilions containing no more than from 20 to 24 beds. The future barracks and hospitals be arranged *en échelon* receive the benefit of prevailing winds. And that detached cottages be erected for married soldiers.

11. That barracks and hospitals be in future constructed with single verandahs only; and for no more than two rows of beds between the opposite windows.

12. That the cubic space per man in future barracks be from 1,000 to 1,500 feet, and the superficial area from 80 to 100 square feet, varying according to the airiness of the position. The same space and area to be allotted in existing barracks.

13. That the beds be so arranged, with respect to windows, doors, and wall spaces as to ensure the benefit of free ventilation, without exposing the men to draughts. That, in existing barracks, where the space between the doors is too small to admit of this, precautions be taken to shelter the beds from draughts. That, in all future barracks, the wall space be made sufficient to keep the beds at the least three feet apart, and at the same time out of the door draught.

14. That the ventilation of barracks and hospitals be sufficiently provided for independently of doors and windows.

15. That in all cavalry barracks, saddlery rooms be provided, and saddles removed out of the barrack rooms.

16. That all barracks and hospitals be provided with sufficient glazed window space to light them, and that they be better lighted at night. Gas to be introduced where practicable.

17. That all barracks be provided with sufficient ablution and bath accommodation, with a constant water supply. That drinking-fountains supplied with filtered water be provided.

18. That barrack cook-houses be improved and better ventilated.

19. That wherever practicable iron or earthenware water latrines, supplied with water, and drained to an outlet, be introduced instead of the present system; that, where this is impracticable, all cess

pits be abolished, and metal or earthenware vessels, to be removed twice a day, substituted. That improved urinals, supplied with jet for lavatory purposes, as well as with a free supply of water for the cleansing and drainage of the urinals, be provided.

20. On the subject of venereal disease, and the means to be employed for its diminution, we refer to the suggestions made by us under that head in the body of the report.

21. That wherever there is a deficiency of married quarters, the same be supplied.

22. That the cubic space in hospitals be fixed at 1,500 feet and upwards, and the superficial area at from 100 to 120 and 130 square feet per bed, according to the healthiness of the position; and that the wall space per bed be never less than eight feet. In existing hospitals the same space and area to be allowed.

23. That every hospital be provided with a constant supply of pure filtered water, and with drainage.

24. That every hospital be provided with ablution accommodation, with fixed basins, and with baths, having hot and cold water laid on conveniently accessible from the wards.

25. That, wherever practicable, water closets, with drainage and water supply, be introduced for hospital wards, and privies converted into water latrines.

26. That the hospital diet tables in use at home stations be adopted in India as far as practicable, and the hospitals supplied with properly trained cooks.

27. That trained hospital attendants be introduced into all hospitals, and that female nurses, under the new Medical regulation, be introduced into large general hospitals.

28. That in future every regiment in India shall have an adequate number of hospital orderlies from its own ranks to provide personal attendance for the sick.

29. That the number of general hospitals in India be increased by the organization of such hospitals, under the new Medical regulations, at the largest European stations.

30. That the strategical points of the country, which must be occupied, be now fixed with special reference to reducing as far as possible the number of unhealthy stations to be occupied.

31. That a sufficient number of hill stations, or of stations on elevated ground, be provided: and that a third part of the force be located on these stations in rotation.

32. That the sanitary duties of regimental, garrison, and inspecting Medical Officers, prescribed in the new Medical regulations of October 7, 1859, be applied or adapted to all stations in India. And

that properly trained army Medical Officers of health be appointed to this service at the larger stations.

33. The commission entirely approves of medical candidates being required to undergo the course of instruction, including military hygiene at the army medical school, and are of opinion that practical training in sanitary science is of the greatest importance to the public service.

34. Considering also the constant reference to sanitary subjects necessary in carrying out public works in India, they consider it requisite that every cadet of engineers should attend a course of sanitary instruction at Chatham.

35. In order to the gradual introduction of sanitary improvements for barracks, hospitals, and stations, as well as in the seats of Government and throughout towns in proximity to military stations, they recommend the appointment of commissions of public health, one for each presidency, so constituted as to represent the various elements, civil, military, engineering, sanitary, and medical; to give advice and assistance in all matters relating to the public health, such as selection of new stations and the sanitary improvement of existing stations and bazaars; to examine new plans for barracks and hospitals; to advise on the laying out of stations and bazaars, the sanitary improvement of native towns, prevention, and mitigation of epidemic diseases, and generally to exercise a constant oversight on the sanitary condition of the population, European and native; to report on the prevalence, causes, and means of preventing sickness and disease; and further, that administrative measures be adopted to give effect to the advice of the Presidency commissions. That trained Medical Officers of health be appointed, to act in peace as in war, in connexion with these commissions.

36. That in order to render available for India the experience obtained in dealing with all classes of sanitary questions in England, two officers of the Indian Government be appointed in England to be associated with the War Office Commission for this special purpose; unless it should be thought preferable to appoint a similar commission specially for the Indian Department.

37. That a code of regulations, embodying the duties and adapted to the specialties of the Indian sanitary service, be drawn up and issued under authority.

38. That the system of army medical statistics at present in use at home stations, be extended to all stations in India.

39. That a system of registering deaths and the causes of death be established in the large cities of India, and be gradually extended,



so as to determine the effects of local causes on the mortality of the native as well as of the European population : the results to be tabulated and published annually by the Commissions.

All which we humbly certify to your majesty.

(Here follow the Signatures of the Commissioners.)

T. BAKER, Secretary.

Dated 19th May, 1863.

*Practice of Medicine in Oordoo.* By MEER USHRUFF ALLY, G.M., C.B., Sub-Assistant Surgeon ; Lecturer on the Practice of Medicine in the Agra Medical School. Second Edition, enlarged and improved. Printed at the Noorul Absar Press, Agra—1863. Royal 8vo., pp. 268.

IN a former Volume\* of this journal we had the pleasure to notice in generally favorable terms a *Hand-book of Midwifery, Oordoo*, by the author of the above named work. We have now to speak, in terms of far higher praise, of his present contribution to professional literature in the Vernacular. Equally remarkable for the careful selection of subjects, as in his former work, the author here addresses himself only to those who practice the healing art, and consequently we are no longer pained by the conviction, which Meer Ushruff Ali's *Midwifery* forced on us, that the author had undertaken a task that he could not possibly expect to be successful—namely, to make a book of reference, for persons ignorant of professional matters, to which they might fly for guidance, in hours of illness. Here his aim is higher, and we are more thoroughly in accord with him.

His own words will probably best shew his intentions in his present compilation, and we therefore give it in extenso, as we can do little more than notice the style in which our author's task has been performed.

Our former review of Meer Ushruff Ali's work, as well as that of the more recently published work of Bakur Ali and Syed Ali (vide pp. 182 et. seq.) in our present Volume, show sufficiently our estimation of the value of these works and of the credit due to their compilers.

\* Vol. V. pp. 380, at seq.

The Author's Preface runs as follows—

"In preparing the second edition of the *Practice of Medicine* for the press, I have thoroughly revised the work as it appeared in the first edition in 1858. I have also added descriptions of many important maladies, and re-written the Indian diseases from the works of the most recent and best Medical authors, changing the classification of diseases so as to make it correspond with the form which the Principal Inspector General of the Medical Department lately circulated, with the view to enable native doctors to prepare their hospital returns correctly.

In the end I have appended receipts for a few well known syrups, confections, &c., which are daily prescribed by the native hakeems throughout India. These are prepared from ingredients procured from the bazaar and are used by me as substitutes for some European medicines. By frequent administration of the compounds both in the Agra Thomason Hospital and private practice, I have become acquainted with their real action and efficacy in Indian diseases.

This small volume consists chiefly of translations into plain and easy Oordoo of compilations from some of the best English works on Physic, namely, Hooper's Physician's Vade Mecum, Tanner's Manual of the Practice of Medicine, Watson's Lectures on the Principles and Practice of Medicine, Morehead's Researches on Disease in India, &c."

We must confine our remarks on the execution of this work to a very limited space. The subjects are carefully chosen and faithfully translated in clear, simple and intelligible language, and the volume is calculated to be a good guide to the class of students for whom it has been compiled.

In one respect it is marked inferior to the work of Bakur Ali and Syed Ali—namely, in the typography of the work, if we can venture to apply this term. This work is *lithographed*, and the letters want that clearness of outline and distinctness which are so well shown in the *printed* work of the other authors.

But we have perhaps the greater reason to praise the patient zeal of the author who, even labouring under such a disadvantage as inadequate printing apparatus, has produced, so creditably, a valuable work calculated to be of endless service to his pupils.

We wish him all success in his professional career as a well informed and judicious teacher.



## PART III.

### MEDICAL MISCELLANY.

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No. 1.—*A clinical record of Cases of Diseases of Bone, requiring operation.* By JOHN SHORTT, M.D., Zillah Surgeon, Chingleput.

#### CASE 1.—CARIES.

Thunamah, *Æt.* 60, caste Malabar; trade labourer. 15th December 1860, admitted with ulcers on the anterior and superior surface of the right foot. There are several small ulcers shooting out, pale, flabby-looking granulations above the surface of the skin, and the introduction of the probe indicates diseased bone, which is apparently soft, and spongy, as it breaks down under pressure of the probe. The patient states that for the last three years she has been suffering from the above disease, it having shewn itself as a pustule at first, which as it increased in size formed a head, and eventually opened by ulceration, the parts contracted under various applications, leaving her foot in the present state, and the constant pain and irritation have enfeebled her health.

A few days after a short preparatory treatment, she was brought under the influence of chloroform, and the part carefully explored, when the entire metatarsal bone of the great toe and the head of the proximate phalanx was found carious in many parts, the osseous tissue displaced by black grumous jelly-like matter.

The diseased bone was dis-articulated and removed, with the latter half of the diseased phalanx.

The parts were brought together by silver sutures, lint, pad, and bandage. The patient progressed well, and was discharged cured on the 8th February 1861 with a sound foot. The breadth of the foot was compressed outwards from a slight falling in of the parts, in other respects it seemed sound and the patient was able to use it tolerably well.

## CASE 2.—NECROSIS.

Mootoosawmy, *Æt.* 14, caste Malabar; trade labourer. 6th November 1860, admitted, was brought to the Civil Dispensary yesterday by his father, in consequence of an ulcerated leg, which he is stated to have had for the last year, this said to have been occasioned originally by a fall from a tree. Is a lanky delicate looking youth. On examination the left leg from the tuberosity of the tibia to within an inch of the ankle joint is marked by several small ulcers, filled with raised pale, puffy-looking granulations. On placing the point of the probe on these, they were found to lead to the bone which is bare, and the skin in the vicinity is thin, red, and shiny.

After a day's rest and a purgative the patient was put under the influence of chloroform, and an incision along the spine of the tibia exposed, the sequestrum which was extracted without much difficulty, and about an inch of the lower part towards the ankle joint looked as if carious, in consequence of which it was removed by the gouge and the cloaca filled with *charpie*, lint; pad, bandage and cold water dressings applied.

On examination of the *sequestrum* it was found to comprise the entire diameter of the tibia, measured four inches in length, the upper and lower ends having a worm eaten appearance, the cylinder was of a dirty white colour hard and polished. It comprised a mere shell filled with a dark gummy substance of a light reddish liver colour.

The patient progressed satisfactorily during the filling up and contraction of the cloaca, and he was discharged well on the 22nd of the same month.

## CASE 3.—NECROSIS.

Chellen, *Æt.* 14, caste Malabar; trade labourer. 14th June 1863, admitted into the Conjeveram Civil Dispensary with about an inch of the shaft of the left humerus projecting upwards and forwards at the anterior and upper third of the arm. The lad, although of a scrophulous constitution indicated by the thickened lips, wide and thickened alæ of the nose, &c., was apparently in robust health and of a stoutish short make. The only account he gave of the origin of the disease was that an abscess made its appearance there some two or three years ago, and continued to discharge pus until it terminated in the state in which he was ad-

mitted. He did not remember having received any injury in the part. Although projecting it appeared at first firmly imbedded, but on seizing it with a large pair of forceps and swinging it gently from side to side, and then drawing it upwards, it came out without giving the patient any particular pain, leaving a gaping chasm formed by the cloaca, and being bridged over by a thin layer of new bone. Little or no bleeding followed the extraction of the sequestrum. The cloaca was filled with scraped lint. Finding that a bridge of new bone seemed to interfere with the healing from the bottom, it was divided a day or two after and the patient progressed satisfactorily, and was discharged well on the 14th July 1863. On examining the sequestrum it measured  $5\frac{1}{2}$  inches in length and comprised the entire diameter of the humerus, it had the usual worm eaten appearance above and below, and the shell, except on its inner side, was of nearly natural thickness, of a dirty white colour with a polished appearance. On examining the arms before his discharge the right measured  $12\frac{1}{2}$  inches from the projection of the acromion process to the termination of the elbow joint (olecranon), the left only measured  $10\frac{1}{2}$  inches, the left arm seemed stouter and 2 inches shorter than the opposite one. In other respects it appeared quite sound and its movements were normal.

**Remarks.**—In the first case had surgical aid been sought early, it is possible that the disease might have been arrested by the removal of the diseased portion, but from the nature of the parts and the situation of the diseased bone, no relief was obtained till surgical art was called in to remove the offending body, when a cure speedily followed, although the patient was aged and weakly.

The same may be said of the second case, the original fall no doubt injured the bone, so as to cause its death, and nature was endeavouring to remove the foreign body, as it now proved to be, by setting up a tedious process of absorption, but the aid of surgery brought relief in a few days which, if left to nature, it would probably have taken years to accomplish. In case 3rd the powers of nature are better exemplified, when the death of a portion of the bone of the arm had been effected by the constriction probably of the nutritious vessels of the part caused by the swelling, that must have accompanied the abscess said to have first shewn itself. The dead portion was gradually freed from the lin-

ing, but it could not have been thrown out of the part so readily unless aided in some way : this aid it received from muscular action, and the contraction and consolidation going on, in the part to make up for the loss by a deposit of new bone, which favored the protrusion of the foreign body. The dead bone which was gradually working its way to the surface, would no doubt have dropt out of itself eventually, but it would have taken a long time ere this process could have been completed, and by seeking the aid of surgery it was at once effected by the removal of the sequestrum.

I find in the 4th vol. of the "Indian Annals of Medical Science," page 287, two cases of Necrosis very similar, especially that of the arm detailed by W. L. Stewart, Esq., of the Madras Medical Service.

The sequestrum in the last case was sent to the Madras Medical College, and I believe those of the two previous cases, also, were similarly disposed of.

No. 2.—*Case of Calculus Vesicæ. Median Lithotomy by Allarton's method.* By HENRY C. BRODRICK, M.D., Agency Surgeon, Indore.

LIMBAH, aged 10 years, a Mahratta, of very emaciated frame, admitted into the Indore General Hospital, suffering from all the symptoms of a stone in the bladder, which was readily detected with the sound.

Four years ago he had been operated upon for stone by a Mussulman hukeem, who removed a calculus by a cutting operation. On admission the perineum bore the scar usual after the ordinary lateral operation.

For a year after this operation the patient was perfectly free from all symptoms of calculus, but three years ago his sufferings recommenced and were very severe on his admission to hospital.

I bore in mind the fact of the previous operation and the probable amount of injury the prostate had sustained from the hukeem's manipulations ; and on this account elected to perform median lithotomy by *Allarton's method*, which I carried out in the manner described by Mr. Bernard Holt, as practised by him at the Westminster Hospital (*Lancet*, Sept. 8, 1860, p. 231.)

**Operation.**—*November 6th, 1863.*—The staff was passed and the stone struck, and the patient secured in the usual manner after being brought fully under the influence of chloroform, which was poured *guttatim* from a drop bottle on to a domette mask placed on the patient's face.

I have of late frequently made use of the drop bottle and mask, the plan enables the operator to produce profound chloroform sleep with a very moderate expenditure of the anæsthetic.

The drug is dropped from a bottle furnished with a capillary tube, which will allow 30 minims, *and no more* of chloroform to distill at once. To obtain more the bottle must be tilted or reversed, when 30 minims more, or less, are again forced out. I recommend this little piece of apparatus, which is made to Dr. Skinner's pattern by Messrs. Maw of London, to all who have to rely on the assistance of native doctors *only* whilst engaged in capital operations.

To proceed. The patient's thighs being well separated and kept so by an assistant I passed the index finger of my left hand into the rectum, and making out the exact situation of the prostate, steadied that organ against the staff.

At about one quarter of an inch in front of the anus I thrust the point of a straight and rather triangular shaped bistoury, the back of the blade being towards the anus, into the mesian line of the perineum, and pushing it directly upwards and keeping it exactly in the mesion line, I hit the groove of the staff and opened the urethra just in front of the prostrate.

The left forefinger in the rectum during this incision served as a guide for the knife, and at the same time preserved the gut from injury.

The point of the knife, being now in the groove of the staff, was slid slightly backwards and forwards so as to enlarge the incision in the urethra, after which the knife was withdrawn enlarging the tegumentary incision *in exitu*.

The incision was thus all along *upwards*, the back of the blade being towards the anus throughout.

The left forefinger was now withdrawn from the rectum and passed into the wound, and the nail laid in the exposed groove of the staff.

Along this forefinger a long bullet probe was guided into the groove and passed into the bladder.

The assistant in charge of the staff now pulled that instrument steadily but gently towards the symphysis pubis, whilst I as gently pulled the probe downwards.

The forefinger, well oiled, of the left hand was now passed into the wound, and very gently wormed between the staff and probe by the urethral incision into the bladder, dilating very gently the parts en route and placed on the stone.

The staff and probe were now withdrawn and a small pair of forceps introduced into the bladder, the left forefinger being at the same time withdrawn.

Up to this time very little urine had escaped.

The stone proved larger than I had anticipated, and was of so peculiar a shape that I failed to secure it with the first gush of the urine.

Having presently secured it, I removed it very gradually and gently, using very gradual traction.

It proved to be of the lithic acid variety, weighing 243 grains and being of a peculiar heart shaped contour.

The boy was now untied and removed to bed.

He recovered without a single bad symptom, and on November 20th, fourteen days after operation, the urine passed in a full stream entirely by the meatus urinarius.

On the 23rd of November the wound was entirely healed and the boy was discharged cured to his own house 17 days after the operation.

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No. 3.—*Excision of part of the lower jaw for Epithelioma.*

*Recovery. Subsequent death of patient from Cholera.*

By HENRY C. BRODRICK, M.D., Agency Surgeon, Indore.

ALI Buksh, aged 30 years, a Khidmutgar in the service of the Ex-Nawab of Bandah, was admitted to treatment in the Indore General Hospital, suffering from a tumour of the gum on the right side of the lower jaw.



From this situation a fungus looking mass secreting a fetid pus sprung, on the outer side slightly over-topping the teeth, it implicated the bone which was much enlarged, and from its inner side encroached on the space beneath the tongue about one half. The teeth of the side affected, from the last molar to the central incisors, were all loose and turned out of their alveoli.

He reported that he had first noticed a swelling on the gum about three years ago, and that it had progressed gradually since then to its present dimensions.

He made no complaint of pain in the part, but said that his general health appetite, sleep &c., were much impaired.

There was no history of cancer in his family, and the man bore no traces of secondary syphilis about him.

He was very anxious to be relieved of this growth, and as it did not appear that any of the neighbouring lymphatic glands were affected, I resolved to excise the part.

In this I was kindly assisted by Assistant Surgeon J. Pope of Her Majesty's 72nd Highlanders.

**Operation.**—*Nov. 16.*—The patient being seated in a firm strong chair, I passed a stitch through the tongue, in order the more readily to draw this organ forwards in case respiration become obstructed during anesthesia. Chloroform was now administered, and the patient having been thoroughly narcotised, I proceeded to draw several of the loosened teeth.

The growth being too large to admit of my manipulating entirely through the mouth, I made an incision from the right angle of the mouth downwards to the bone, and then outwards along the lower margin of it to the angle of the jaw.

The labial, transversalis faciei, and facial arteries all required ligaturing, and this done, I nicked the jaw at the symphysis and the angle with one of Butcher's smaller saws, and endeavoured to cut through the bone with a strong pair of bone pliers.

Failing in this, I resumed the saw and quickly sawed through the bone in each situation and then rapidly turned the mass outwards and dissected the growth from its connections beneath the tongue.

The whole mass removed, I sought in vain for any diseased patches that might have been left; the cut edges of the bone seemed perfectly healthy, and it was clear that all the disease had been included in the mass removed.

A small artery (dental) in the cut surface of the ramus of the jaw bled rather freely and could not be secured, but ceased on its lurking place being plugged with a morsel of cotton soaked in the Tinct. Ferri Sesquichloridi.

The large gaping wound was now cleaned of confula and carefully stuffed with lint soaked in a weak solution of Condy's disinfecting fluid, the lint being so disposed as to keep the tongue in position and give support to the cheek.

With the chance of secondary hemorrhage before me, I thought it better not to stitch the wound up until the following day.

So much chloroform had been consumed during this long and formidable operation, that there was some difficulty in bringing the patient round, and, on his recovering consciousness, the heart's action was so feeble, that it was necessary to give him strong doses of brandy and water by means of a feeding cup with a long spout.

In the evening he was warm and comfortable, and the pulse had recovered itself.

*Nov. 17th.*—The patient had passed a good night, there had been no bleeding during the night, and he expressed by signs that he was comfortable and free from pain.

The dressings were now removed and fresh lint soaked in weak Condy's solution applied as before, the gap being first gently syringed with the same lotion. The edges were then brought together by the interrupted suture with adhesive plaster and a bandage to give support, and a silk veil was thrown over all to protect the part from flies.

*Nov. 18th.*—A great part of the wound in the lips and cheek had united by the first intention, the wound in the mouth was discharging healthy pus, and the man in all respects doing well. During the day the weather became cloudy and close, and the patient was restless and somewhat warm, and on examining the wound on the following morning I found the greater part of it opened out, the sutures in

the line of the wound along the jaw had torn through and the wound generally looked unpromising.

The part of the incision that extended from the angle of the mouth to the point when it turned backwards and outwards had healed by the first intention, but it was evident that the rest of the wound had to be repaired more gradually.

The dressings were turned out, the wound syringed with oleum terebinthinæ, and then stuffed with lint soaked, as before, in the Condyl's solution.

. Strips of adhesive plaster were so disposed as to give support to the interrupted segments of the maxilla left, which were in constant risk of being distorted by the movements of the patient's face in drinking, &c., and the whole arrangement was carefully supported by a bandage.

The man proved to be an opium eater, and during the further progress of the case, he was allowed a daily ration of Malwa opium.

Every day I renewed the dressings, the wound being most carefully and gently washed out with Condyl's fluid, and occasionally with the oleum terebinthinæ before re-stuffing it.

The case progressed most satisfactorily, the gap in the mouth filling up fast; the man's spirits and appetite remained excellent, and everything promised a speedy recovery. Eventually the external wounds healed firmly, excepting one small fistulous opening, whilst repair went on so rapidly in the inside of the mouth that he was able to articulate perfectly and conversed easily and constantly with his friends.

During December cholera prevailed sporadically in the city of Indore, and to my great grief and disappointment, the patient, on the very eve of a perfect recovery, was seized with vomiting and purging on the 30th and died in a few hours.

I must add that on examination of the tumour, immediately after its removal, I found it was of the epitheliomatous variety.

The portion of the maxilla that the disease had engaged in its growth, was altered into a fine spicular skeleton, enclosing a mass of softish, almost cerebriform structure divided by a rather tough fibrous stroma.

There were no traces of secondary deposit, apparently, in the neighbouring lymphatic glands, and it seemed as though the disease were entirely local.

The use of the solution of Permanganates (Condy's fluid) was, I considered, of great service in the conduct of this case: it seemed to control the decomposition of the fluids in the mouth, pus saliva, &c., and so to favor healthy granulation, besides altering favorably those portions of the discharge that the patient unavoidably swallowed.

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No. 4.—*Quarterly Report on the Mortality of Madras for the Months of October, November and December 1863.*

By W. R. CORNISH, Secretary, Principal Inspector Genl., Medical Department.

It is satisfactory to have to report that the population of the Presidency town has, during the months of October, November and December, been healthy.

2. The North-east monsoon has been a favorable one, and more than a fair average of rain has fallen during this season. Subsequent to the cessation of the rains, there have been a few deaths from cholera, and in one or two places the disease has shown an epidemic tendency, but the total number of fatal cases recorded during the quarter was only 133.

3. There have been 2,629 deaths in the three months. The mean of eight corresponding periods is 2,721·9, so that the deaths have been slightly below the average.

4. The mortality of the European residents has been singularly low. There were 59 casualties in the first quarter, 32 in the second, 32 in the third, and only 20 in the last three months.

5. The total number of deaths registered during the year is 11,858, and it is a matter of congratulation that, owing to the general salubrity of the seasons, the mortality is absolutely lower than in any year since 1859. If the population can be reckoned at 4,50,000 the ratio of mortality in 1863

has been only a little in excess of 26 per thousand. In 1862 it was 34.

*Deaths in Madras—Fourth Quarter of 1863.*

|                                                                | Europeans. |     | East Indians. |      | Hindoos. |        | Mahomedans. |       | Total. |        | General total of both sexes. |
|----------------------------------------------------------------|------------|-----|---------------|------|----------|--------|-------------|-------|--------|--------|------------------------------|
|                                                                | M.         | F.  | M.            | F.   | M.       | F.     | M.          | F.    | M.     | F.     |                              |
| <i>Miasmatic Diseases</i>                                      |            |     |               |      |          |        |             |       |        |        |                              |
| Small Pox ...                                                  | ...        | ... | ...           | ...  | 11       | 7      | ...         | 1     | 11     | 8      | 19                           |
| Measles ...                                                    | ...        | ... | 1             | ...  | 1        | ...    | ...         | ...   | 2      | ...    | 2                            |
| Fevers...                                                      | 1          | 1   | 1             | 3    | 258      | 211    | 19          | 18    | 279    | 233    | 512                          |
| Dysentery ...                                                  | 1          | 1   | 2             | 4    | 127      | 122    | 15          | 28    | 145    | 155    | 300                          |
| Diarrhoea ...                                                  | 2          | ... | 4             | 4    | 109      | 106    | 4           | 7     | 119    | 117    | 236                          |
| Cholera...                                                     | 1          | ... | 5             | 1    | 53       | 63     | 7           | 3     | 66     | 67     | 133                          |
| Total of Miasmatic Diseases                                    | 5          | 2   | 13            | 12   | 559      | 509    | 45          | 57    | 622    | 580    | 1202                         |
| Total of all other Diseases.                                   | 9          | 4   | 31            | 14   | 686      | 481    | 102         | 120   | 808    | 619    | 1427                         |
|                                                                | 14         | 6   | 44            | 26   | 1225     | 990    | 147         | 177   | 1430   | 1199   | 2629                         |
| Mean mortality of eight fourth quarters, from 1855 to 1862 ... |            |     |               |      |          |        |             |       |        |        |                              |
| Miasmatic Diseases ...                                         | 11.1       | 3.1 | 15.3          | 13.4 | 645.9    | 615.6  | 93.1        | 92.5  | 765.4  | 724.6  | 1490.—                       |
| Other Diseases ...                                             | 17.3       | 5.4 | 18.1          | 18.9 | 538.6    | 466.—  | 86.—        | 82.6  | 660.—  | 571.9  | 1231.9                       |
|                                                                | 28.4       | 8.5 | 33.4          | 32.3 | 1184.5   | 1080.6 | 179.1       | 175.1 | 1425.4 | 1296.5 | 2721.9                       |
| <i>Increase or Decrease.</i>                                   |            |     |               |      |          |        |             |       |        |        |                              |
| Increase...                                                    | ...        | ... | 43            | ...  | ...      | ...    | ...         | ...   | ...    | ...    | ...                          |
| Decrease ...                                                   | 16.9       | ... | ...           | ...  | 50.1     | ...    | 30.2        | ...   | ...    | ...    | 92.9                         |

No. 5.—*On Vegetables suitable for use by Europeans in Burmah.* By E. G. BALFOUR, Deputy Inspector General of Hospitals.

(Published by request of the Committee Agricultural and Horticultural Society of Madras.)

IN British Burmah there is the greatest difficulty in obtaining vegetables which Europeans esteem, and it is a matter of much thought how to increase the supply.

The soldiers' gardens of Rangoon only yield, at certain seasons, small quantities of the cultivated varieties, which, though of value, are quite insufficient for the general wants; and when, lately at Thayetmyo, I found that there was great difficulty in procuring vegetables. Those in use amongst the troops are fresh potatoes and preserved potatoes, both of which are imported: cabbages and one or two other vegetables familiar to Europeans are temporary: there is abundance of the sweet potato (*Batatas edulis*) in its season, and of various kinds of yams (one of which the Cocos, seemingly a species of *Colocasia*\*, is the most prized): as also are plentiful, pumpkins, onions, cucumbers and several potherbs known as country vegetables.

I cannot learn that potatoes have ever been cultivated successfully in any part of British Burmah. The late Major Harris tried to grow them in Rangoon, but without success. Captain Moore mentions that he saw a few small ones, which had been produced at Maulmain; and Captain Duncan has seen the potato tried in the plains, but they all ran to top, and the potatoes were not larger than cherries. They have certainly not been cultivated to any extent in any of the provinces of British Burmah. Potatoes are, therefore, all imported, and, for those persons who use them all the year round, they require to be imported afresh throughout the rainy season from May to October, as, at that period of the year, they very rapidly spoil. Importations from Calcutta are, thus, continuous. The prices in Rangoon, accordingly, range high, running from 4 and 5 annas to one rupee, or even one and a half rupee the viss of about 3½ lbs.

In a soldier's ration, he is allowed one pound of vegetables daily. In Rangoon, from January till about March or April

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\* Possibly *Colocasia antiquorum*, see in "*Cyclopædia of India*," see also Cocos. It is largely cultivated all over Burmah and is much used in Madras.

the Commissariat Department are able to supply European vegetables, by purchasing up the produce of the soldiers' cultivation in their gardens, and in the vicinity of their dwellings; but, in Thayetmyo, the Soldiers' gardens have not yet been formed, though they are in progress. The 60th Rifles formerly cultivated a few vegetables near their barracks, there, but have ceased to do so for the past year.

At Tounghoo, the Commissariat were able to supply cabbages occasionally, and the soldiers had commenced gardens at the beginning of this year: though there, as perhaps throughout Burmah, they seem to prefer rearing poultry.

When at Thayetmyo, recently, I found the soldiers using the Cocos yam (*colocasia*) and the sweet potato: for, at that season of the year (June,) vegetables were disappearing, but onions, cucumbers, and pumpkins, in their seasons, are also issued at Thayetmyo. In Rangoon after April until the rains in May, pumpkins, and sweet potatoes are issued, and during the rains, preserved potatoes are issued with whatever country vegetables can be procured.

The difficulties, in British Burmah, in obtaining vegetables with which Europeans are familiar and their great cost seem to have turned the late Major Harris' thoughts to Great Britain and, in November 1859, he obtained a supply of preserved potatoes direct from England.

|                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>Years. Quantities.</i><br/> 1859— 1 ton.<br/> 1860—10 "<br/> 1861—12 "<br/> 1862—12 "<br/> 1863—10 "</p> | <p>but the quantities received and distributed in each year, since then, have been as per margin. These have increased from 1 ton in 1859 to 12 tons in 1862, and, though letter No. 50 of 17th April 1863, from Her Majesty's Secretary of State for India, does not mention the quantity now to be shipped, for 1863, I observe in a prior despatch that, for 1863, ten tons had been asked for.</p> |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

At Thayetmyo, at the beginning of this month, I saw the sick of the Artillery and of the Rifles being supplied with them and in good condition.

The average cost price, in London, of preserved potatoes, has been about £40 per ton, and in Rangoon £54-16-4½, equal to Rs. 548-3-3.

Preserved potatoes from England, therefore, independent of their keeping longer, are cheaper than the imported round potatoes sold in these provinces. In the Commissariat issue of preserved potatoes, four ounces are given as an equivalent to one pound of fresh vegetables\* so a ton (lbs. 2240) of preserved potatoes, value, say, Rs. 548-3-3, will give 8,960 rations; the total cost of each ration of preserved potatoes, therefore (*i. e.* of each 4 oz. of preserved potatoes issued as the equivalent of 1 lb. vegetables), is 11-7 pie, or nearly an anna a ration. This rate (at the issued equivalent rate) is cheaper than potatoes from Calcutta are sold, and cheaper than the prevailing market rates at which potatoes sell at Madras, where they range from 4 to 10 annas a viss of 3½ lbs.

There need not be any hesitation in believing that potatoes could be grown in many of the higher parts of British Burmah, and there are many such; and, as a vegetable whose wholesome character has been recognized by most races, the political officers of the Commission could not, perhaps, in the way of new food articles, confer on the Burmese, Talaings, Karens, and Shans a greater benefit than to induce them to grow potatoes for their own use and for sale. But the Burmese are a people essentially fond of ease, and the potato plant requires infinitely more care than is needed for yams; also, the people of Burmah are indescribably indifferent, as we would think, alike as to the plants they eat, as to the parts of the plant: and the roots, the leaves, the sprouts, the shoots or tubers, and the fruit, the bark, or the blossoms of many are in use among them. Indeed the Reverend Dr. Mason, also, remarks that nearly every plant produces a vegetable for the natives, and he mentions that though there is a great variety of vegetables indigenous or cultivated in Burmah, they are scarce and rarely for sale in the bazaars. This indifference on the part of the Burmese races to the articles which they use as vegetables, is remarkably in contrast with the fastidious selection of particular herbs, &c., which other races make. The customs of the people, in this respect, seem however beyond question; for, in numerous memoranda, &c., on the sparseness of its population which Colonel Phayre has received from all parts of British Bur-

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\* This rate is higher than that ordered in Her Majesty's Medical Regulations for the Sick: viz—"1 oz. of the preserved to 5 oz. of fresh; and mixed preserved vegetables in the proportion of 1 oz. to 10 oz. of fresh."



mah, and has asked me to report on generally, almost every member of the Commission has expressed the opinion that some parts, at least, of the sickness and mortality in infant life, and even amongst the grown people, are the result of the careless indifference of these races, as to the vegetable substances which they use as food.

From what I have seen of British Burmah, its people are now rapidly growing in wealth and are acquiring their subsistence with the utmost ease—only day of labor suffices to earn several days' support, and the women of the household largely contribute to the income of the family. It seems improbable, therefore, that they will soon take to the cultivation of those European vegetables that are difficult to rear. In this view, the facility with which all animal and vegetable substances are preserved, points to the preserved products of Europe as, for the present at least, more likely to afford cheap and abundant supplies of vegetables for the Europeans of Burmah, of kinds with which they are familiar. And as the bulk of the European soldiers are on the Irawady river, supplies for them can be landed at a carriage rate comparatively insignificant. But though potatoes and other better known European edible plants are not produced in British Burmah, I do not think that we have done all that we might have done; for there are other vegetables obtainable, some of them common to Asia, others peculiar to Burmah, and several of them greatly prized. But it is, unfortunately, a custom of the European races to designate by the term "*country*" all the products of a foreign land which do not happen to be familiar to them, and, thus, we hear each other speak of "*country woods*" "*country vegetables*," &c., and we use this term as one implying inferiority.

Several years ago, Mr. Jaffrey of the Madras Agri-Horticultural gardens, in a useful brochure, did much to make known the plants in common use as vegetables and potherbs amongst the natives of Southern India, and considering the great daily cost of the item of 70,000lbs. of vegetables for the 70,000 Europeans in India, and the difficulty at all times of procuring them, services such as Mr. Jaffrey could render, all over India, would be of great value. I suggest that his services be asked for, to visit British Burmah and report on the plants which its people use as vegetable food, indicating such of them as are suitable for Europeans, and reporting how to increase or, by cultivation, improve the supply. He

would complete this labour in a year, and it would be labour well applied, Mr. Jaffrey is now in the Calcutta Gardens.

On joining this Division I desired my servants to bring daily to the house some new vegetables of the country that I might become acquainted with all: but I have been travelling so continuously—twice up to the frontier at Thayetmyo, twice to Maulmain, and once via the Andamans to Mergui and Tavoy, that I have been able to do little in that way. The Reverend Dr. Mason, however, during his residence for a third of a century in these territories, has devoted much attention to all their products, and has given a large list of the vegetables in use. Dr. McClelland, Principal Inspector General, Bengal, also, in his reports, gave an extended list of the food and oil plants cultivated in Pegu, and from both of these authors the following list is framed:—

*Dioscorea species*—Elephant foot yam—Next in value to *Dioscorea fasciculata*

Do *fasciculata*—Karen potato. Tavoy potato—The best Burmah vegetable

Do *globosa*—Large white yam—Of white yams the most in repute

Do *atropurpurea*—Dark purple yam—One of the best yams

Do *purpurea*—Purple yam—Character not given

Do *glabra*—Smooth yam—Said to be cultivated in Pegu

Do *rubella*—Red yam— do do

Do *anguina*—Snake yam— do do

Do *demoua*—Wild yam—Very acrid. Eaten only in times of scarcity

*Jatropha manihot*—Manihot the source of tapioca

*Hedysarum tuberosum*—Butraj yam—Character not given

*Arum furfuraceum*—Scaly yam— do

*Hibiscus sabdariffa*—Red sorrel—Curry and tarts

Do *longifolia*—Variety sorrel— do

*Tricosanthes anguina*—Snake gourd—In vegetable curries, in very general demand

Do *cucumerina*—Bitter gourd—Eaten by natives only

*Lagenaria vulgaris*—Bottle gourd, white pumpkin

Do *pepo*—The pumpkin.

Do *melopepo*—The squash

*Luffa pentandra*—Long white skinned gourd—Considered by natives a delicious vegetable

Do *foetida*—Angular gourd—With butter, pepper and salt is little inferior to green peas

*Momordica charantia*—Used in curries

Do *dioecia*—Occasionally eaten by the natives

*Cucumis utilissimus*—Cucumber—Consumed in immense quantities

Do *usitata*—Large cucumber

Do *sativus*—Common cucumber

Do *citrullus*—Water melon

- Solanum melongena*—Brinjal : egg-plant—One of the best vegetables
- Lycopersicum esculentum*—Tomato : Love apple—Cultivated in many gardens
- Abelmoschus esculentus*—Ochro (Bendi kai, Tamil)—Abounds in Burmah and is delicious
- Basella alba*—Malabar night shade—Succulent stem and leaves said to be not inferior to spinage
- Amaranthus oleraceus*—Nepaul spinage—Several varieties cultivated and eaten like spinage
- Do *polygamus*—Green bajee—For vegetable curries
- Do *atropurpurea*— do do
- Allium Ascalonicum* ?—Onion—A very excellent vegetable sold at 2 to 4 ann. a vis of 3½lbs.
- Do *porrum*—Leek—Abundant in native gardens
- Portulaca oleracea*—Purslane—Used by the natives as a pot herb
- Dillenia scabra*—Water dillenia—Its large green fruit is a favourite vegetable with the natives
- Cyperus*—Sedge root—Used as a vegetable, but tastes like filberts
- Bambusa*—Bamboo shoots—Used as a vegetable, and pickled
- Lactuca sativa*—Lettuce—Only in towns cultivated by European & Chinese gardeners
- Fungales*—Mushrooms—Fungi are very numerous, but some are not edible. At the beginning of the rains, I have seen crowds gathering fungi.
- Spathium Chinense*—Chinese spathium—Root nearly as good as potatoes
- Plectranthus aromaticus*—Burman borage—A good substitute for borage
- Ocymum villosum*—Mint for curries
- Melilotus*—Melilot
- Agati grandiflora*—Agati—The legumes, a favourite vegetable everywhere
- Cajanus Indicus*—Dholl or doll
- Dolichos catjang*—Long or French bean
- Do *pilosus*—Wild dolichos
- Phaseolus trilobus*—French beans, wild.
- Moringa pterygosperma*—Horse radish tree—Pods, a favourite addition to curries
- Brassica oleracea*—Cabbage—Seldom in the market
- Do *rapo*—Turnips— do do
- Raphanus sativus*—Radish—In all bazars
- Cucurbita maxima*—Pumpkin or red or squash gourd—A common vegetable ; when boiled, resembles in taste a fine tender carrot
- Benincasa cerifera*—White pumpkin or white gourd—Karens and Burmans esteem it as a vegetable in their curries
- Batatas edulis*—Sweet potato—Very abundant
- Amorphophallus campanulatus*—Telinga potato—Much esteemed by Burmans and Karens
- Colocasia antiquorum*—Cocos yam ? supplies place of potato.

*Solanum tuberosum*—Common potato—All imported

*Pisum sativum*—Pea—Produces well in some localities

*Paophocarpus tetragonolobus*—Goa bean—Esculent roots are eaten like potato ;  
a very tolerable vegetable

*Canavalia gladiata*—Sword bean—Young pods used as a vegetable

*Do obtusifolia*—Wild sword bean

*Labiab vulgare*—Indian kidney bean, French bean—As kidney beans of Europe

*Cyamopsis psoraloides*—Native bean—By natives, esteemed a good vegetable

I will endeavour to add to the above list, the Burmese, Talaing, Karen and Shan synonyms, and send it to the Commissariat officers in this division, as it may be of some use to them in their duties of providing the supplies to the European soldiers.

If Mr. Jaffrey's services be obtained, and indeed even if they are not obtained, it may be of service to all who would interest themselves in the matter, to mention that Captain Duncan, Inspector General of Police, agrees with me in opinion that the Burmese will not readily become careful gardeners : but, he adds, the Chinese are great adepts, and readily try all new species given to them. The Chinese are spread all over Burmah, and he thinks that it would be through them that new edible vegetables would be produced or old ones improved. In Maulmain, he has seen them come to Captain Furlong, who was then Executive Engineer, and who used to get vegetable seeds from the Calcutta Horticultural Society, and the Chinese prized the seeds very much, some of their gardens in the outskirts, being well worth a visit,



**METEOROLOGICAL RESULTS from the Madras Observatory**  
*Register, for the month of October, 1863.*

| 1863. | Barometer corrected<br>and reduced to 32°<br>Fahr. | Standard Thermometer. |        |                 |      | Wind.                      |                    | Depth of Rain. | GENERAL REMARKS.                     |
|-------|----------------------------------------------------|-----------------------|--------|-----------------|------|----------------------------|--------------------|----------------|--------------------------------------|
|       |                                                    | Observed<br>Extremes. |        | Daily<br>Means. |      | Prevailing Di-<br>rection. | Daily<br>Velocity. |                |                                      |
|       |                                                    | Maxim.                | Minim. | Dry.            | Wet. |                            |                    |                |                                      |
|       | Inches.                                            | °                     | °      | °               | °    |                            | Mls.               | Ina.           |                                      |
| 1st   | 29.723                                             | 96.6                  | 77.4   | 85.7            | 78.3 | S. by W.                   | 147                | .....          | Cloudy.                              |
| 2nd   | 725                                                | 95.7                  | 78.3   | 85.9            | 77.2 | S. E.                      | 151                | .....          | Chiefly overcast. } .                |
| 3rd   | 752                                                | 93.2                  | 75.6   | 83.3            | 75.2 | S. W.                      | 149                | 0.99           | Overcast. }                          |
| 4th   | 758                                                | 93.3                  | 77.6   | 84.4            | 75.8 | S. S. W.                   | 146                | .....          | Chiefly overcast.                    |
| 5th   | 734                                                | 93.6                  | 77.4   | 85.2            | 75.2 | S. W.                      | 133                | .....          | Cloudy.                              |
| 6th   | 735                                                | 95.2                  | 77.2   | 84.5            | 77.1 | S. by E.                   | 137                | .....          | Cloudy: clear night.                 |
| 7th   | 779                                                | 94.9                  | 77.2   | 84.4            | 76.5 | S.                         | 125                | .....          | Light clouds.                        |
| 8th   | 813                                                | 92.7                  | 78.0   | 85.8            | 76.8 | S. E. by S.                | 102                | .....          | Fine.                                |
| 9th   | 836                                                | 92.7                  | 78.6   | 84.0            | 77.7 | S. S. E.                   | 105                | .....          | Light haze.                          |
| 10th  | 820                                                | 91.4                  | 77.4   | 84.8            | 77.5 | S. E.                      | 117                | .....          | Light clouds.                        |
| 11th  | 841                                                | 90.1                  | 77.6   | 84.5            | 77.0 | S. E.                      | 98                 | .....          | Chiefly fine.                        |
| 12th  | 866                                                | 89.6                  | 76.8   | 83.6            | 76.8 | E. by S.                   | 91                 | .....          | Passing clouds.                      |
| 13th  | 855                                                | 91.2                  | 78.6   | 83.3            | 76.6 | N. N. E.                   | 103                | .....          | Heavy clouds.                        |
| 14th  | 868                                                | 78.3                  | 75.3   | 75.9            | 73.8 | N. W.                      | 109                | 3.22           | { Overcast: rain from 5½ A. M.       |
| 15th  | 846                                                | 83.3                  | 74.6   | 77.0            | 75.6 | N. by W.                   | 80                 | 1.10           | { 1 P. M.                            |
| 16th  | 853                                                | 84.8                  | 75.6   | 81.1            | 77.1 | N.                         | 101                | 0.25           | { Overcast: rain at 7 A. M., 3 P. M. |
| 17th  | 798                                                | 82.4                  | 75.4   | 77.5            | 75.2 | N. by W.                   | 94                 | 1.33           | { 7 P. M.                            |
| 18th  | 767                                                | 85.6                  | 74.3   | 80.6            | 76.6 | N. by E.                   | 130                | .....          | Rain chiefly before 4 A. M.          |
| 19th  | 682                                                | 82.6                  | 76.4   | 79.5            | 76.0 | N. E.                      | 323                | 0.87           | Passing clouds.                      |
| 20th  | 797                                                | 83.7                  | 74.6   | 76.3            | 74.8 | S. E. by S.                | 175                | 2.57           | Stormy.                              |
| 21st  | 888                                                | 82.5                  | 74.0   | 76.2            | 75.2 | S. S. E.                   | 109                | 3.81           | Rainy; heaviest about 6 A. M.        |
| 22nd  | 885                                                | 81.4                  | 73.1   | 77.1            | 75.2 | { S. S. W.                 | 50                 | 0.07           | Frequent rain.                       |
| 23rd  | 872                                                | 81.9                  | 71.4   | 76.7            | 73.9 | { & N. N. E.               | 105                | 1.41           | { Shower at 10½ A. M. Generally      |
| 24th  | 837                                                | 83.2                  | 72.9   | 78.3            | 74.3 | N. N. W.                   | 119                | 0.02           | { cast.                              |
| 25th  | 827                                                | 76.4                  | 72.8   | 75.4            | 73.9 | S. W.                      | 93                 | 1.45           | { Chiefly overcast. Rain from        |
| 26th  | 794                                                | 85.4                  | 73.9   | 79.2            | 75.4 | SW by W                    | 58                 | .....          | { 11½ A. M.                          |
| 27th  | 769                                                | 86.3                  | 75.2   | 80.0            | 75.3 | { N. E. & S.               | 91                 | .....          | Chiefly overcast.                    |
| 28th  | 849                                                | 87.3                  | 76.6   | 80.8            | 77.0 | { W. by S.                 | 82                 | .....          | Overcast with frequent rain.         |
| 29th  | 886                                                | 86.3                  | 76.9   | 81.0            | 75.0 | S. E.                      | 102                | .....          | Passing clouds.                      |
| 30th  | 889                                                | 85.2                  | 75.1   | 79.6            | 75.3 | N. by E.                   | 71                 | .....          | Fine.                                |
| 31st  | 854                                                | 84.8                  | 74.6   | 80.3            | 75.1 | N. N. E.                   | 79                 | .....          | Do.                                  |

\* N. B.—A heavy thunder-storm from 11½ P. M., on the 2nd to 1½ A. M., on the 3rd. Lightning vivid and continuous: wind revolving from E. round by S. and W. to N.; to S. W.; forward again to N.; back to W.; forward to E.; back again thro' E., N., S. and E. to N. E.; and lastly settled in South at the end of the storm.

The Standard Barometer and Thermometers are read at 10 A. M., 4 P. M., and 10 P. M. Daily means are obtained by the application of hourly corrections deduced from two observations. The cistern of the Barometer is 27 feet above the level of the sea; the level of the Rain gauge is 3 feet from the ground. The wind and rain registered during the current civil day—from midnight to midnight.

**METEOROLOGICAL RESULTS** *from the Madras Observatory*  
*Register, for the month of November 1863.*

|           | Barometer corrected<br>and reduced to 32°<br>Fahr. | Standard Thermometer. |        |                 |             | Wind.                      |                    | Depth of Rain. | GENERAL REMARKS.                    |
|-----------|----------------------------------------------------|-----------------------|--------|-----------------|-------------|----------------------------|--------------------|----------------|-------------------------------------|
|           |                                                    | Observed<br>Extremes. |        | Daily<br>Means. |             | Prevailing Di-<br>rection. | Daily<br>Velocity. |                |                                     |
|           |                                                    | Maxim.                | Minim. | Dry.            | Wet.        |                            |                    |                |                                     |
| Inches.   |                                                    |                       |        |                 |             |                            | Mls.               | Ins.           |                                     |
| 29-853    | 85-3                                               | 75-9                  | 80-4   | 75-7            | N. N. E.    |                            | 133                | .....          | Flying clouds.                      |
| d -878    | 83-6                                               | 75-0                  | 79-2   | 70-6            | N. N. E.    |                            | 162                | .....          | Fine.                               |
| d -902    | 83-4                                               | 69-8                  | 76-9   | 69-3            | N. N. E.    |                            | 140                | .....          | Light haze.                         |
| h -891    | 82-9                                               | 69-7                  | 75-5   | 68-0            | N.          |                            | 109                | .....          | Fine.                               |
| h -848    | 83-5                                               | 67-7                  | 77-0   | 68-3            | N.          |                            | 95                 | .....          | Do.                                 |
| h -849    | 83-9                                               | 72-6                  | 78-8   | 71-6            | N. N. E.    |                            | 118                | .....          | Overcast till sunrise, fine after.  |
| h -886    | 83-8                                               | 71-5                  | 78-6   | 71-7            | N. N. E.    |                            | 120                | .....          | Fine.                               |
| h -908    | 83-5                                               | 71-7                  | 78-6   | 70-8            | N. N. E.    |                            | 129                | .....          | Do.                                 |
| h -912    | 83-5                                               | 72-9                  | 78-3   | 71-1            | N. E by N.  |                            | 109                | .....          | Fine after sunrise.                 |
| h -935    | 82-8                                               | 71-1                  | 77-8   | 71-2            | N. E by N.  |                            | 114                | .....          | Fine.                               |
| h -942    | 83-0                                               | 70-5                  | 76-9   | 71-1            | N. N. E.    |                            | 101                | .....          | Do.                                 |
| h -919    | 83-7                                               | 71-8                  | 76-1   | 70-3            | N. N. E.    |                            | 87                 | .....          | Do.                                 |
| h -900    | 84-8                                               | 69-5                  | 76-8   | 71-4            | N. N. E.    |                            | 73                 | .....          | Do.                                 |
| h -892    | 86-5                                               | 72-9                  | 79-6   | 73-5            | W & E by N  |                            | 70                 | .....          | Do.                                 |
| h -919    | 84-7                                               | 74-1                  | 79-8   | 74-5            | E.          |                            | 95                 | .....          | Fine after sunrise.                 |
| h -939    | 83-5                                               | 73-7                  | 77-2   | 75-1            | N. E.       |                            | 76                 | 0-55           | Cloudy : showers after 9½ A. M.     |
| h -934    | 83-0                                               | 74-7                  | 79-1   | 75-5            | N. N. E.    |                            | 117                | 0-32           | Nearly Overcast. Showers after 5    |
| h -956    | 82-1                                               | 73-9                  | 79-4   | 76-1            | N. by W.    |                            | 161                | 0-26           | Overcast with light showers. [P. M. |
| h -983    | 82-9                                               | 76-5                  | 77-3   | 73-8            | N. E. by E. |                            | 173                | 0-42           | Overcast ; rain at 4½ and 7 P. M.   |
| h -969    | 83-5                                               | 75-3                  | 79-7   | 74-3            | N. E.       |                            | 153                | 0-01           | Cloudy with light showers,          |
| st -978   | 83-5                                               | 76-3                  | 79-3   | 72-7            | N. E.       |                            | 181                | 0-02           | Passing clouds.                     |
| nd -999   | 82-2                                               | 71-5                  | 77-4   | 69-7            | N. N. E.    |                            | 131                | .....          | Do.                                 |
| rd 30-003 | 82-4                                               | 70-1                  | 75-9   | 73-4            | N.          |                            | 93                 | 0-09           | Cloudy ; rain at 7½ A. M.           |
| h -005    | 82-9                                               | 72-3                  | 77-4   | 72-9            | N. N. E.    |                            | 109                | 0-01           | Flying clouds.                      |
| h 29-993  | 83-0                                               | 73-0                  | 78-3   | 72-2            | N. E by N.  |                            | 133                | 0-01           | Do.                                 |
| h -972    | 82-2                                               | 72-2                  | 78-0   | 72-0            | N. N. E.    |                            | 123                | .....          | Fine with flying clouds.            |
| h -958    | 82-1                                               | 71-1                  | 76-8   | 70-6            | N. N. E.    |                            | 124                | .....          | Do.                                 |
| h -975    | 82-5                                               | 70-3                  | 77-8   | 71-1            | N. N. E.    |                            | 140                | .....          | Do.                                 |
| h -975    | 82-5                                               | 70-7                  | 77-5   | 70-7            | N. by E.    |                            | 177                | .....          | Do.                                 |
| h -952    | 81-6                                               | 73-7                  | 77-7   | 70-3            | N. N. E.    |                            | 228                | 0-34           | Chiefly overcast : rain at 1½ A. M. |

The Standard Barometer and Thermometers are read at 10 A.M., 4 P.M., and 10 P.M., and the daily means are obtained by the application of hourly corrections deduced from twenty years' observations. The cistern of the Barometer is 27 feet above the level of the sea, and the receiver of the Rain gauge is 3 feet from the ground. The wind and rain registered are for the current civil day—from midnight to midnight,

**METEOROLOGICAL RESULTS from the Madras Observatory  
Register, for the month of December, 1863.**

| 1863. | Barometer corrected<br>and reduced to 32°<br>Fahr. | Standard Thermometer. |        |                 |      | Wind.                      |                    | Depth of Rain. | GENERAL REMARKS.                  |
|-------|----------------------------------------------------|-----------------------|--------|-----------------|------|----------------------------|--------------------|----------------|-----------------------------------|
|       |                                                    | Observed<br>Extremes. |        | Daily<br>means. |      | Prevailing Di-<br>rection. | Daily<br>Velocity. |                |                                   |
|       |                                                    | Maxim.                | Minim. | Dry.            | Wet. |                            |                    |                |                                   |
|       | Inches.                                            | °                     | °      | °               | °    |                            | Mls.               | Ins.           |                                   |
| 1st   | 29.897                                             | 76.3                  | 71.6   | 73.7            | 72.0 | N.                         | 214                | 2.38           | Rainy after sunrise.              |
| 2nd   | .955                                               | 77.0                  | 71.9   | 75.1            | 73.3 | N. E.                      | 172                | 1.92           | Overcast; most rain about noon.   |
| 3rd   | .983                                               | 79.5                  | 73.4   | 75.4            | 73.8 | N. E.                      | 107                | 1.55           | Rainy, especially before sunrise. |
| 4th   | .982                                               | 73.9                  | 71.8   | 72.6            | 71.4 | N.                         | 99                 | 5.48           | Heavy rain nearly all day.        |
| 5th   | .998                                               | 76.4                  | 71.5   | 73.5            | 71.5 | N. N. W.                   | 98                 | 1.98           | Rainy morning; cloudy afternoon.  |
| 6th   | .964                                               | 79.5                  | 72.9   | 76.3            | 71.6 | N. E.                      | 146                | 0.08           | Overcast, with light showers.     |
| 7th   | .968                                               | 79.5                  | 69.9   | 75.5            | 70.8 | N. E.                      | 97                 | .....          | Fine.                             |
| 8th   | 30.001                                             | 78.8                  | 68.8   | 73.9            | 70.8 | N. E.                      | 93                 | .....          | Light clouds.                     |
| 9th   | .024                                               | 78.9                  | 66.9   | 74.4            | 67.0 | N. E.                      | 101                | .....          | Frequently clouded.               |
| 10th  | .022                                               | 78.9                  | 69.4   | 74.3            | 67.5 | N.                         | 109                | .....          | Flying clouds.                    |
| 11th  | .012                                               | 79.5                  | 68.9   | 75.3            | 68.7 | N. N. E.                   | 109                | .....          | Do.                               |
| 12th  | .032                                               | 79.5                  | 68.2   | 75.1            | 69.4 | N. E. by N.                | 136                | .....          | Do.                               |
| 13th  | .037                                               | 79.5                  | 69.9   | 74.4            | 69.0 | N. N. E.                   | 143                | .....          | Light clouds.                     |
| 14th  | .027                                               | 79.5                  | 66.6   | 74.3            | 68.2 | N. E. by N.                | 134                | .....          | Flying clouds.                    |
| 15th  | .015                                               | 79.7                  | 67.5   | 74.8            | 68.5 | N. E. by N.                | 151                | .....          | Do.                               |
| 16th  | .009                                               | 79.8                  | 68.7   | 74.8            | 68.4 | N. E. by N.                | 118                | .....          | Chiefly fine.                     |
| 17th  | 29.986                                             | 78.5                  | 67.4   | 72.6            | 67.1 | N. N. E.                   | 110                | .....          | Fine, with flying clouds.         |
| 18th  | 30.031                                             | 79.3                  | 65.1   | 73.5            | 67.9 | N. E. by N.                | 114                | .....          | Do.                               |
| 19th  | .035                                               | 79.4                  | 70.3   | 74.4            | 67.8 | N. N. E.                   | 151                | .....          | Do.                               |
| 20th  | .039                                               | 79.2                  | 69.7   | 75.0            | 68.7 | N. N. E.                   | 163                | .....          | Do.                               |
| 21st  | .055                                               | 78.8                  | 67.7   | 74.7            | 67.2 | N. E. by N.                | 136                | .....          | Do.                               |
| 22nd  | .038                                               | 79.3                  | 67.9   | 74.0            | 68.4 | N. N. E.                   | 113                | .....          | Do.                               |
| 23rd  | .035                                               | 79.5                  | 68.1   | 73.2            | 68.2 | N. N. E.                   | 82                 | .....          | Do.                               |
| 24th  | .036                                               | 79.5                  | 65.5   | 73.4            | 69.3 | N. N. E.                   | 104                | .....          | Do.                               |
| 25th  | .009                                               | 79.6                  | 71.4   | 76.2            | 67.7 | N. N. E.                   | 174                | 0.02           | Do.                               |
| 26th  | 29.989                                             | 80.1                  | 71.1   | 76.0            | 69.0 | N. E. by N.                | 181                | .....          | Do.                               |
| 27th  | .991                                               | 80.0                  | 68.7   | 75.2            | 69.2 | N. N. E.                   | 158                | .....          | Chiefly overcast.                 |
| 28th  | 30.007                                             | 79.8                  | 74.8   | 76.0            | 71.0 | N. N. E.                   | 188                | 0.02           | Overcast.                         |
| 29th  | 29.999                                             | 80.4                  | 70.7   | 74.7            | 69.7 | N. N. E.                   | 150                | .....          | Chiefly clouded.                  |
| 30th  | .988                                               | 78.8                  | 67.7   | 72.5            | 67.6 | N. N. E.                   | 124                | .....          | Fine, with flying clouds.         |
| 31st  | .979                                               | 78.5                  | 65.7   | 71.9            | 67.0 | N. N. E.                   | 100                | .....          | Flying clouds.                    |

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## PART IV.

### MEDICAL INTELLIGENCE.

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#### **Government Orders on the Annual Report of the Madras Medical College, for 1862-63.**

*(From Proceedings of the Madras Government in the Educational Department.)*

Read the following letter from the Director of Public Instruction :—

(Here enter 23rd June 1863.)

Order thereon, 25th January 1864, No. 25.

With the letter above recorded, the Director of Public Instruction has forwarded the Annual Report on the state and progress of the Medical College for the year 1862-63.

2. The Governor in Council has deferred passing orders on this report, as it raises important questions bearing upon the efficiency of the College and of the Subordinate Medical Department, and is closely connected with the scheme for the re-organization of the Subordinate Medical Department, which it was hoped would have been settled before this. It has, however, been deemed necessary to postpone the re-organization of that Department until other important questions affecting the Indian Medical service generally, which are still under the consideration of the Home Government, shall have been determined. The Governor in Council, therefore, proceeds to offer such remarks as occur to him on those points in the report, which can be settled apart from the question of re-organizing the Subordinate Medical Department.

3. The first matter which calls for notice is the difficulty of forming from the report and its enclosures any clear and definite conclusions as to the progress of the several Departments of the College. This is especially noticeable with reference to the Senior and Second Departments, which, in the remarks both of the Principal and the Professors, are group-



ed together instead of being noticed separately as they unquestionably should be, the standard of attainments to be arrived at in the two Departments being essentially different. The practice here referred to has doubtless arisen from the system which, it is understood, still obtains of teaching the students in the two Departments together instead of forming them into separate classes. It appears to the Governor in Council very questionable whether this system should be maintained. In the Senior Department the course extends over five years; in the Second Department over three years; and if the Governor in Council rightly understands the arrangements in force, two students entering the College together, one in the Senior and the other in the Junior Department, attend the same lectures on those subjects which are common to both for the first three years, at the end of which time the senior student, having two years more to remain in College, goes on during the next two years attending lectures on the same subjects, and treated exactly in the same way as those which he has attended in his three years' course. The Principal should be requested to state whether the above is a correct description of the system now in force, and whether separate provision cannot be made for the instruction of the students in the Senior Department, at all events, in their fourth and fifth years.

4. The Committee of Examiners, the Principal and several of the Professors, consider the three years' course to which the students of the second Department—candidates for employment as Assistant Apothecaries—are limited, to be too short, and the Government examiners speak of the standard of attainments now required from these students as "too low a qualification for the responsible duties which these young men may soon be called upon to perform." In quoting this opinion the Director of Public Instruction observes that it is very far from being in accordance with that of Mr. Shaw, the late Principal. The standard now prescribed for admission to the grade of Assistant Apothecary was laid down in 1858. After very full consideration, and owing to representations made by His Excellency the Commander-in-Chief and concurred in by several Medical officers of experience, to the effect that the standard formerly demanded was too high and the period (four years) which the students of this grade were required to pass in the College was needlessly long. The Governor in Council would not be disposed to sanction any alteration either in

regard to the standard of instruction or the period of College study, but it may be a question whether candidates for employment in the Subordinate Medical Department, both for Apothecary and Dressers' grades, might not with advantage pass a year in a hospital before being sent to the College. They would there acquire a knowledge of Medical language, which would enable them to profit by the Professor's lectures much more thoroughly than it would appear that the majority of them do under the present system.

The Director will give his opinion on this suggestion after communicating with the Principal Inspector General of the Medical Department, and the Principal of the College. But whatever may be done to improve the qualifications of the students on admission, the instruction can never be efficient, unless the Professors ascertain, by constant questioning, how far the students have been able to grasp the subject matter of the lectures. This is a point which cannot be too often urged.

5. Adverting to the remarks in the concluding paragraph of the Director's letter, the Governor in Council does not gather that the regulations in connection with the Senior Department are considered either by the Principal or Professors, or by the Committee of Examiners to be defective. His Honor in Council has alluded at the commencement of these Proceedings to one defect which appears to call for a remedy, and when submitting the report there called for, it will be the duty of the Principal to offer any suggestions that may occur to him for improving the efficiency of this Department of the College.

6. But little is said in the reports of the progress of the Junior Department. As, however, all the members of the first class, 24 in number, were found qualified for the post of Hospital Assistant, it is to be presumed that the progress of this Department during the year under review was satisfactory.

7. The Director has not adverted to the requirements noticed in the reports of the Professor of Midwifery and Diseases of the Eye for those classes. The Principal should be called upon to submit in a separate letter a list of the articles which he considers requisite. Such requisitions should not be made in the Annual reports.

**Sickness in the Grand Jail at Madras***Proceedings of the Madras Government.*

**READ** the following letter from **ROBERT COLE, Esq.,** Principal Inspector General, Medical Department, Fort Saint George; to the Honorable **A. J. ARBUTHNOT,** Chief Secretary to Government, Judicial Department, Fort Saint George, dated 5th November 1863, No. 244.

I have the honor to forward herewith a report by Inspector General of Hospitals **J. Shaw, F.R.C.S.,** whom I deputed to inquire into the prevalence of sickness amongst the prisoners\* in the Grand Jail.

No. 44, dated Madras 29th  
October 1863.  
\* Of Salem.

2. I agree with Mr. Shaw, in thinking that the diet is defective, and a principal cause of the weakly condition of many of the prisoners, and would recommend a trial of the diet scale alluded to in his letter.

3. The scale does not contain any provision for the usual ingredients of curry powder which might be given as at present, or if necessary the quantity of each ingredient can be laid down.

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From **JAMES SHAW, Esq.,** Inspector General of Hospitals; to the Secretary to the Principal Inspector General, Medical Department, dated Madras, 29th October 1863, No. 44.

In accordance with the instructions from the Principal Inspector General, conveyed in your letter, No. 2936, October 26th, 1863, I have the honor to report, that I visited the Jail on the 27th instant, and carefully inspected the native convicts from Salem.

2. I was accompanied by the Deputy Inspector General of the Division, and the Officer in Medical charge of the Jail.

3. The number of convicts received on the 15th of July was one hundred, six are dead, seven are in hospital, sixteen upon the convalescent list, leaving seventy-one well.

4. Of the six cases who died, I find upon referring to the Medical Journal, that—

1. Anthony, died of dysentery. 2. Saddegaudoo, was admitted anæmic and anasarca. 3. Lutchmun had œdematous feet ulcerated, gums and diarrhœa supervened. 4. Vera-

cooty, was admitted with œdema, terminating in general dropsy. 5. Pilla Kalig, œdema and diarrhœa. 6 Baulen, anasarca with diarrhœa.

5. Six of the seven men in hospital are anæmic subjects, two have general anasarca, in one the urine is decidedly albuminous, in both highly alkaline, four are in a state of considerable debility with œdema of the feet, the 7th man has an abscess. Two of the men in hospital are in a most precarious state.

6. Of the sixteen convalescents four or five are debilitated subjects; of the rest a few are suffering from spongy gums, and others are dyspeptic, as evidenced by swollen and indented tongues.

7. The convalescents have each 4  $\frac{3}{4}$  of meat daily, and they work with the others; this is said to be their own wish; they will all, I think, do well.

8. The sick in hospital get such diet as the Medical Officer considers right.

9. The diet for the prisoners in health is—5 $\frac{1}{2}$  ollocks of rice, 6-20 pollum of chilly, 1-40 pollum of pepper, 3-4 pollum of tamarind, 1-50 measure of salt, 12-100 of a pice of curry stuff, 96-100 of a pice of curry (meat?) Fire-wood.

10. No dietary could well be compiled which contained fewer nutritious elements than the one given above. Rice forms the bulk of the food, this of all the grain used as food contains the least amount of gluten or flesh making material. The 96-100 part of a pice of meat cannot compensate for the want of the nitrogenous and undue proportion of the carboniferous elements contained in the diet.

11. The men who have died, and those who are now on the sick report labored under asthenia, or what may be designated debility of the whole economy, and that this must be attributed to the faulty diet; I fear there can be no doubt.

12. I beg to recommend that the diet recommended at page 44 in the "Report of the Dietaries in Zillah Jails," lately prepared by Mr. Cornish, be at once introduced, with the modification in the quantity of mutton, which I have reduced to 15  $\frac{3}{4}$  a week in the annexed table. I think that article is in excess, 24  $\frac{3}{4}$  a week is considered sufficient for a European soldier, and the same for a European convict at Ootacamund under sentences of "hard labour," 15  $\frac{3}{4}$  of

meat weekly has been found sufficient to keep the native convicts at Coimbatore in health. This table is the first authoritative attempt in this Presidency to introduce "a dietary for prisons," founded upon experience and scientific principles, and should it answer with the Salem prisoners, I strongly recommend its being adopted in all the jails, with the modifications for different districts, suggested by Mr. Cornish.

*Proposed Dietary.*

|                               | Monday. | Tuesday. | Wednesday. | Thursday. | Friday. | Saturday. | Sunday. |
|-------------------------------|---------|----------|------------|-----------|---------|-----------|---------|
|                               | oz.     | oz.      |            |           |         |           |         |
| Rice .....                    | ...     | ...      | ...        | ...       | ...     | ...       | 12      |
| Raggy.....                    | 16      | 8        | 16         | 8         | ...     | 16        | 12      |
| Cumboo.....                   | ...     | ...      | 8          | ...       | 8       | ...       | ...     |
| Cholum.....                   | 8       | 16       | ...        | 16        | 16      | 8         | ...     |
| Dholl.....                    | 6       | ...      | 2          | 2         | 6       | 4         | 2       |
| Mutton.....                   | ...     | 5        | ...        | 5         | ...     | ...       | 5       |
| Fish .....                    | ...     | ...      | 6          | ...       | ...     | 6         | ...     |
| Butter-Milk.....              | 12      | ...      | ...        | ...       | 12      | ...       | 8       |
| Ghee.....                     | 1       | 1        | 1          | 1         | 1       | 1         | 1       |
| Tamarind . . . . .            | 1       | 1        | 1          | 1         | 1       | 1         | 1       |
| Salt. ....                    | 1       | 1        | 1          | 1         | 1       | 1         | 1       |
| Green Vegetables.....         | 6       | ...      | 6          | ...       | 6       | ...       | ...     |
| Plantain or other fruits..... | ..      | ...      | ...        | 6         | ...     | ...       | 6       |

ORDER THEREON, 10th November 1863, No. 1754.

The Governor in Council authorizes the adoption of the diet table proposed by the Inspector General of Hospitals, with the addition of curry stuff in such quantities as the Principal Inspector General may deem necessary. It should be introduced at once.

[NOTE.—The good result of Mr. Shaw's recommendation may be seen recorded at p. 57—58 of our present No.—ED. M. Q. J.]

**A proposed Cure for Carbuncle.**

WE quote from *Galignani* the following proposed cure for this formidable affection.

"Our readers may remember an appeal addressed to the public by a French parish-priest, in order to obtain funds for the publica-

tion of a pamphlet in which an infallible remedy for carbuncle was to be revealed. This plan seems now to have been abandoned for the simpler one of publishing the remedy in one of the medical journals ; for we find in the *Union Medicale* an article by Dr. Topinard, in which he describes the *Dardelle* secret as follows :—‘ Prepare a round piece of linen of a sufficient size to cover the whole diseased part, and spread thereon a slight film of storax ointment, and then a layer of corrosive sublimate (bichloride of mercury) of the thickness of a two-franc piece. The plaster thus prepared is laid with the greatest care upon the part affected, and kept in its place with strips of sticking plaster. After 24 hours this plaster may be removed, and it will then be infallibly found that the carbuncle or pustule has been destroyed. The place must now be dressed three times a day with storax ointment spread upon linen ; and at every dressing the part must be fomented with a mixture of the oils of linseed, lily, camomile, and hypericum. In the course of eight or ten days the eschar falls off, and the sore is treated like a common one.’ This remedy, discovered by a blacksmith of the name of *Dardelle*, has never been known to fail ; Dr. Missa, from whom the prescription has been obtained, has used it these ten years with invariable success ; and Dr. Topinard considers with reason that sublimate exercises a specific action in such cases. It is the more desirable that such a remedy should be widely circulated, since this very morning we find a new case of a man at Annouville-Vilmesnil, near Fecamp, who having been stung on one of his fingers by a venomous fly, neglected applying proper remedies ; and the consequence is that his finger has had to be amputated to prevent gangrene. He is now doing well.

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### Old Hospital Clothing.

WE learn from a contemporary that

“ A very judicious order has been issued by Government for the disposal of unserviceable Hospital clothing. The order directs the medical officer to present before the Survey Committee the clothing in a clean state, and when the clothing is condemned, it is to be handed over to the European Troops for the purpose of cleaning their Rifles. The Committee have full power to direct any portion of the unserviceable clothing to be burnt where there is reasonable grounds for so doing, such as any recent infectious disease. This is the plan adopted in Bengal, and we think the assimilation is wise.”

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### Travelling allowances to Medical Officers in Civil Employ.

THE following orders have been issued by the Madras Government on this subject.

"Fort St. George, 17th November 1863.

No. 406 of 1863.—The following decisions passed by the Government of India, are declared applicable to this Presidency.

Medical Officers required to travel to a distance, to replace others withdrawn for Civil employment, are authorised to join at the public expense.

Travelling Allowance is not claimable, however, by Medical Officers proceeding to join an appointment of higher emoluments than that they quit ; in such cases, the relieving Officer must proceed at his own expense."

### A proposed Cure for Burns.

A NOVEL application for this purpose is recommended in *Galignani*, but we are somewhat sceptical as to its practical use :—

"The long sufferings, ending but too often in death, which result from injuries caused by fire, invest every suggestion tending to remove them with peculiar interest. We, therefore, borrow the following from *Les Mondes*, a scientific review, which advocates the application of electricity, by means of a Volta-Faradaic apparatus. We must here premise that *faradization* is an operation first proposed by Professor Faraday, in which electricity is applied to the human body in intermittent currents ; for instance, in the painter's cholera, in which case the pain caused by the apparatus overpowers that caused by the disease, and ultimately removes it. The *modus operandi* proposed for burns is as follows :—The part of the body which has suffered from the effects of fire is immersed in a basin, or if necessary a bath of water ; the negative pole of the apparatus is put into communication with the water by means of the usual conductor, while a wire from the positive pole communicates with some point of the body out of the water and not far distant from the part affected. The electrical current is thus carried over the latter, its force being regulated according to the patient's strength. To ascertain whether sufficient electricity has been administered, the patient exposes the burn for an instant to the air ; and if he does not feel the inflammation any more, the operation may be suspended ; in the contrary case it must be resumed until that effect is produced. So long as the part affected remains immersed in water under the influence of electricity, the patient feels no pain. In mild cases, an hour's exposure to electricity is sufficient for a complete cure ; in more serious cases it must be continued for three or four hours, but the cure is stated to be both prompt and certain. When the whole person has been injured by the flames, the patient must be put into a bath with the negative pole in the direction of the feet, and

the positive one placed in contact with the nape of the neck. Part of the water must be changed every quarter of an hour, to prevent the bath from getting warm. The discoverer of this method is Dr. Rebold."

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### **Cinchona Plants at Darjeeling.**

FROM the Punjab *Government Gazette* we learn that

"The number of Cinchona plants in the Nursery at Darjeeling about the end of August last was 6,530 of all species, being an increase of 1,910 since 15th June. The best species, it appears, were only propagated, but the propagation of the plants is much below what would have been accomplished were it possible to supply pots in sufficient quantity. Some delay was caused in the transit of several thousand pots from Calcutta to the Nursery, the result being that no cuttings could be "potted off," and none made until the arrival of the pots. No damage, however, has been caused by the delay, and the only loss that has occurred is the passing away of two months of the most favourable season of the year for propagation, while the plants intended for propagation were covered with vigorous shoots, each of which might now have been a well rooted plant."

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### **The duties of Medical Officers in regard to Sanitation.**

WE direct especial attention to the following :—

"Fort St. George, 24th October 1863.

No. 82.—The Commander-in-Chief is pleased to publish and make applicable to this Army the following Extract from Her Majesty's Medical (Sanitary) Regulations.

Para. 1, page 77.—The Medical Department of the Army and its Officers are charged not only with the Medical care of the sick, but with the duty of recommending to Commanding Officers verbally, or in writing, whatever precautionary measures as to Barracks, Encampments, Garrisons, Stations, Hospitals, Transports, Diet, Dress, Drills and Duties may, in the opinion of the Department and its Officers, conduce to the preservation of the health of the Troops, and to the mitigation or prevention of disease in the Army whether at home or abroad. But in the event of any verbal representation not being complied with, the Medical Officer shall make a representation in writing on the subject, to his Commanding Officer."



**Chaplains' visits to Hospitals.***Proceedings of the Madras Government.*

READ the following letter from the Right Reverend the Bishop of Madras ; to His Excellency the Governor in Council, Fort Saint George, dated the Adyar, Madras, 12th October 1863.

I have the honor to acknowledge the receipt of Government Order, 2nd October, No. 231, referring to me a letter from Colonel Primrose, proposing the introduction into Military hospitals of books, for the Registry of Chaplains' visits.

I think the proposed regulation is a desirable one.

In stating my approval, however, I venture to submit for your Excellency's consideration whether, the Chaplains being more immediately under the authority of Government, it will not be advisable that the order to them should be issued by your Excellency in Council through the usual channel rather than through the Military Department.

(Signed) F. MADRAS.

ORDER THEREON, 20th October 1863, No. 250.

The Governor in Council approves of the course suggested by the Right Reverend the Bishop in the 3rd paragraph of the foregoing letter, and he accordingly directs that the sub-joined rules shall be observed at every European Military hospital in this Presidency.

I. A book shall be placed in every European Military hospital to be entitled "The Chaplain's Register of his visits and services in the Hospital."

II. This book is to be provided by the Chaplain, and each visit and service performed at the hospital is to be entered in it.

III. It is to be kept for the information of the Bishop, and is to be open to the inspection of the Military and Hospital authorities.

IV. It is not to be removed from the hospital. The Medical Officer in charge is to arrange for its safe custody and production when required by the Chaplain, or for inspection.

**Report on the Number, Distribution and Condition of Chinchona plants on the Neilgherries, on the 31st December 1863. By W. G. McIvor, &c.**

(From Proceedings of the Madras Government.)

| Species.                  | Botanical names.                                          | Commercial names.    | No. of plants. | Value per lb. of Dry Bark in the London Market. |       |
|---------------------------|-----------------------------------------------------------|----------------------|----------------|-------------------------------------------------|-------|
|                           |                                                           |                      |                | s. d.                                           | s. d. |
| 1                         | C. Succirubra.....                                        | Red Bark.....        | 86,742         | 2 6 to 8                                        | 9     |
| 2                         | C. Calisaya.....                                          | Yellow Bark.....     | 1,768          | 2 10 to 7                                       | 0     |
| 3                         | C. Officinalis,<br>Var Condaminea<br>(C. Uritusinga)..... | Original Loxa Bark.. | 6,350          | 2 10 to 7                                       | 0     |
| 4                         | Do. Var Bonplan-<br>dia<br>(C. Chahuarguera)..            | Select Crown Bark.   | 155,780        | 2 10 to 7                                       | 0     |
| 5                         | C. Crespilla.....                                         | Fins Crown Bark....  | 1,569          | 2 10 to 6                                       | 0     |
| 6                         | C. Lancifolia.....                                        | Pitayo Bark.....     | 61             | 8 to 2                                          | 10    |
| 7                         | C. Nitida.....                                            | Genuine Grey Bark... | 8,406          | 1 8 to 2                                        | 10    |
| 8                         | C. Species without<br>name.....                           | Fine Grey Bark.....  | 2,745          | 1 8 to 2                                        | 9     |
| 9                         | C. Micrantha.....                                         | Grey Bark....        | 10,139         | 1 8 to 2                                        | 10    |
| 10                        | C. Peruviana.....                                         | Finest Grey Bark...  | 3,153          | 1 8 to 2                                        | 9     |
| 11                        | C. Pahudiana.....                                         | Unknown.....         | 425            | Unknown.                                        |       |
| Total number of plants... |                                                           |                      | 277,083        |                                                 |       |

**TABLE II.—Memorandum of the growth of eleven plants of *C. Succirubra* planted on the 2nd Denison Plantation, at Neddivuttum, on the 30th August 1862.**

| No. of plants. | Height in inches when planted on the 30th Aug. 1862. | Height in inches on the 30th Nov. 1863. | Height in inches on the 31st Dec. 1863. | Height in inches during Dec. 1863. | By whom planted.                    |
|----------------|------------------------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------|-------------------------------------|
| No. 1          | 23                                                   | 92                                      | 93                                      | 1                                  | His Excellency Sir William Denison. |
| 2              | 16½                                                  | 84                                      | 86                                      | 2                                  |                                     |
| 3              | 19                                                   | 79½                                     | 81                                      | 1½                                 |                                     |
| 4              | 15                                                   | 84                                      | 86                                      | 2                                  |                                     |
| 5              | 27                                                   | 98                                      | 99                                      | 1                                  |                                     |
| 6              | 20                                                   | 73                                      | 74                                      | 1                                  |                                     |
| No. 7          | 20                                                   | 89                                      | 90                                      | 1                                  | J. W. Brecks, Esq.                  |
| 8              | 18                                                   | 87                                      | 89                                      | 2                                  | Dr. Sanderson.                      |
| 9              | 20                                                   | 88                                      | 89                                      | 1                                  | J. D. Sim, Esq.                     |
| 10             | 20                                                   | 94                                      | 94                                      | 0                                  | Lieutenant McLeod.                  |
| 11             | 18                                                   | 85½                                     | 87                                      | 1½                                 | P. Grant, Esq.                      |

TABLE III.—Showing the height of twelve plants of *C. Officinalis* planted on the Dodabetta Plantation at Ootacamund on the 30th September 1863.

| No. of plants. | Height in inches when planted on the 30th September 1863. | Height in in. on the 30th Nov. 1863. | Height in in. on the 31st Dec. 1863. | Growth in in. during Dec. 1863. |
|----------------|-----------------------------------------------------------|--------------------------------------|--------------------------------------|---------------------------------|
| No. 1          | 19                                                        | 25                                   | 28                                   | 3                               |
| " 2            | 14½                                                       | 19½                                  | 22                                   | 2½                              |
| " 3            | 28                                                        | 34½                                  | 41                                   | 6½                              |
| " 4            | 22                                                        | 28                                   | 30                                   | 2                               |
| " 5            | 21½                                                       | 27                                   | 29                                   | 2                               |
| " 6            | 28                                                        | 35                                   | 38                                   | 3                               |
| " 7            | 22½                                                       | 28½                                  | 29½                                  | 1                               |
| " 8            | 21½                                                       | 30                                   | 32½                                  | 2½                              |
| " 9            | 21½                                                       | 29                                   | 32                                   | 3                               |
| " 10           | 19½                                                       | 27                                   | 29                                   | 2                               |
| " 11           | 24                                                        | 29                                   | 31                                   | 2                               |
| " 12           | 24                                                        | 28                                   | 30                                   | 2                               |

## REMARKS.

The planting season having passed the number of plants permanently planted out on the plantations remain the same as at the end of last month, viz., 66,622.

The increase by propagation during the month is 18,657 or 2,603 plants above the average of the last six months, making the total number of plants 277,083.

Table II exhibits the growth of eleven plants planted out by His Excellency the Governor and other gentlemen at Neddivuttum on the 30th August 1862. The average growth of these plants during the month is 1½ inches or 2 inches less than the average growth of last month.

The two plants cut down on the 20th of March last, for the bark submitted to Mr. Howard for analysis, have made strong shoots from 19½ to 21 inches in height. The average growth of these plants during the month is 2 inches or ¼ inch under the average growth of last month.

The twelve plants of *Chinchona Officinalis* (a shrubby species) on the Dodabetta plantation gives an average growth of 2½ inches during the month, or ¼ inch under the average growth of last month.

The number of plants issued to the public is 970, making the total number of plants distributed 7,532.

A few capsules on the flowering plant of *Chinchona Sucirubra* are fully formed and have every appearance of maturing seeds.

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**Revised plan for improving the Madras Medical College.**

*(Proceedings of the Madras Government.)*

READ the following letter from E. B. POWELL, Esq., Director of Public Instruction; to the Chief Secretary to Government, Fort Saint George, dated Madras, 8th January 1864, No. 33.

In Order of Government, No. 204, of the 15th August 1863, His Excellency the Governor in Council sanctioned the enlargement of the principal theatre of the Medical College, and directed the Superintending Engineer, 4th Division, to revise, in communication with myself, the plan and estimate for the improvement of the building.\*

2. The revision had been almost completed at the time of Dr. Smith's appointment to the Principalship of the College. I thought it advisable, however, to make that gentleman acquainted with the proposed modifications: and, on learning from him that some requirements of the College had not been provided for, and that the Professors generally had not been consulted upon the matter, I thought it fitting to request Dr. Smith to go over the modified plan in consultation with the Professors, and to suggest such changes and additions as would fully meet the wants of the College, at the same time paying all due regard to economy.

3. Dr. Smith acted in conformity with my request; and, after consulting with the other Professors of the College, forwarded to me a letter noted marginally, together with a plan showing the arrangements considered advisable by himself and his colleagues. The plan contains elevations for the front and sides of the College; and in these respects it appears to me to possess a great superiority over

No. 131, dated 12th November 1863.

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\* Vide this Journal Vol. VII. p. 475.

the original design. Dr. Smith's letter and plan are herewith submitted.

4. The chief additions now suggested are as follows :—

(1.) A private room for the Chemical Examiner, whose analyses should be conducted so as to preclude the possibility of any person having access to the substance under examination.

(2.) A private room for the Principal.

(3.) Rooms for the Junior Department of College, in lieu of the range of old buildings now occupied as Lecture and Practical Pharmacy rooms. The present Chemical Laboratory, which was proposed for this purpose, besides being inconvenient, is too limited in space.

(4.) A general store-room for distilling apparatus and other bulky articles.

(5.) A room for preparing specimens for the Museum.

(6.) A small retiring room for the Professors.

5. Of the foregoing, the rooms for the Principal and the Chemical Examiners are proposed to be placed upstairs. By this arrangement, besides meeting the wants of the College as regards accommodation, they will serve to break the dead uniformity of a long frontage, and very much improve the architectural effect of the College. Complete privacy will also be secured for the Chemical Examiner's operations, which could not well be the case if they were carried on in the Laboratory.

6. The Superintending Engineer has now placed in my hands a rough estimate of the modified structure according to Dr.

Letter from the Superintending Engineer, 4th Division, No. 4342 of 5th January 1864.

Letter from Executive Engineer, Presidency, No. 4599 of 19th December 1863.

Smith's plan, prepared by the Presidency Executive Engineer. This, together with the letters giving cover to it, as noted in the margin,

I beg to submit ; and I trust that Government will be pleased to approve of the plan, and sanction the expenditure involved therein, which Captain Prendergast estimates roughly at Rupees 32,500. In case of a general approval being given by Government, a more exact estimate and a more complete plan can be prepared by the Department of Public Works.

7. In conclusion, I have to express my regret that so great a delay should have occurred in respect to the improvement of the Medical College building ; but it appeared to me preferable to incur the loss of some time than to carry

out a plan which would in all probability be found very defective.

ORDER THEREON, 16th January 1864, No. 14.

The Governor in Council approves of the alterations and additions to the Medical College building, which have been recommended by the Principal. A revised plan and estimate will be prepared by the Executive Engineer as suggested by the Director of Public Instruction at the close of his letter.

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### **Alleged incorrectness of the rates of Mortality asserted to maintain in the Army in India.**

As may be seen from the following extract from the proceedings of the British Association, the correctness of the conclusions of the Royal Commission (vide page 198) as to the present rate of army mortality in India is seriously questioned.

We hope to be able in future Numbers of this periodical to investigate this subject in detail.

The proceedings referred to are as follows :—

“ Dr. Bird stated in the discussion that Dr. Camp's paper seemed to be an abstract of the Sanitary Commissioners' Report, which he contended—by leaving out the ratio between peace and war—was not correct in its statistics. The returns were mixed returns ; it was absolutely necessary, in order to obtain a correct result, that the peace and war returns should be separated. He had no fear of the climate, if the sanitary measures necessary were carried out. Dr. E. Balfour said, in 1849, that he differed entirely from Col. Sykes' conclusion, that intemperance and vice were the main causes of disease ; and he (Dr. Bird) differed from them also. The causes of the excessive mortality were heat, moisture, and localities. The station reports showed that—although vice and intemperance had their effect. The Colonel seemed to think that the rate of mortality in India was 67·9. He had shown that in the last 26 years it had scarcely exceeded 44, and in the last five it had not exceeded 35. He dissented from the Colonel's opinion as to the excellence of the barracks. The great mortality was increased by ill-ventilated barracks and the filthy cesspools in the midst of them. He believed the proper remedial measures applied to them would cause life to be preserved in India as well as in any other country. He held that the respiratory functions of the human body could be acclimatised to a warm region ; but it was impossible to acclimatise any human

body to miasmata, and he fully believed that in order to lessen the mortality of the troops in India, it would be necessary to lay a good foundation for the barracks, and attend to their arrangements as carefully as those of workhouses and hospitals in this country.

Dr. Hunt entirely disagreed with Dr. Bird on the subject of acclimatisation. There was a physiological change produced, but it was not acclimatisation, but the gradual production of disease. With regard to the fact of the mortality being put down to intemperance and immorality, he must say he could find no evidence of that. It was certain that in such hot climates as that of India it was necessary for European inhabitants to take stimulants; the defence of teetotalism for India was objectionable. He held that there should be a judicious selection of men suited to hot climates; they could not preserve every one in health there. As for attempting to rear the children of European parents, the system was utterly false. Throughout the whole of Bengal there was not the third generation of Europeans; the mortality among children was excessive, and in fact, it was utterly impossible to rear children. His conclusion was that the only way to create a decrement of mortality among the troops would be the selection of men suitable for the climate.

Colonel Sykes defended the commission from the statements of Dr. Bird; for their reports they had the authority of a very great number of witnesses, and there could be no impeachment of the integrity of its members. Where great heat and moisture existed disease prevailed; but he found that where great heat prevailed along with dryness it was not detrimental to the health of the men. The great evil of the whole system was the employment of European troops in such numbers without real necessity, thus causing an enormous amount of misery amongst the families of the laboring poor in England. That was what most of all he deplored. A very great deal of expense had been incurred in barrack accommodation; and he was still of opinion that vice and intemperance were fruitful sources of disease. After considering what we had lost, the question for them was what were we likely to lose in the future. At all events, we should preserve our power in India with the very smallest possible number of English troops; and he should even be inclined for us to run some risk for the sake of humanity, and for the preservation of the youthful blood and sinew of the country.

Dr. Hancock was of opinion that vice was a great source of the disease in India, but that was created in a great measure by the restrictions on marriage. The climate was not the cause. The arbitrary restrictions on the marriage of the men deprived them alike of friends and family, and they were driven to the vices which ultimately brought them to the hospitals.

Colonel Baker thought that the conclusion drawn from the papers before them, that the average 67·9 per thousand was the true aver-

age of the mortality of troops in India, was erroneous. He maintained that the sanitary measures of the Government in India had been very effective, and had reduced the average mortality in time of peace.

## Reports on the Sanitary Condition of the Stations of the Madras Railway, with Orders of Government thereon.

(I.)

EARLY in the month of January the attention of the public and of Government was arrested by the following letter in one of the Daily papers.

*To the Editor of the Madras Times.*

SIR,—Through the medium of your columns I beg to draw attention to the disgusting state of the Railway stations between Madras and Coimbatore—a subject which has, I understand, been several times brought to the notice of the Railway authorities. The stations are receptacles for filth of a most unwholesome description, which, instead of being cleared away, is allowed to pollute the atmosphere, and they are in fact becoming a focus to which cholera is attaching itself. They may probably before long become the means of destroying human life to a frightful extent. Every day increases the evil, and unless something is done it may become dangerous travelling by rail.

With my wife, child, one male and two female servants we left Shoranoor on January 2nd. We slept at Salem, the next night at Vellore, and at midday, on the 4th, we arrived at Madras. The same night the ayah was attacked by virulent cholera—she died in 14 hours; the maty was attacked within three hours, but I hope he will recover. No doubt the disease was contracted at Vellore station the state of which was disgusting in the extreme,

Yours truly,

FRANCIS DAY,

*Civil Surgeon, Cochin.*

Madras, January 7th, 1864.

A few days subsequently the following orders of Government were issued :—

(II.)

“The attention of the Governor in Council has been attracted to a letter addressed to the *Madras Times* newspaper by Dr. Day, Civil Surgeon at Cochin, complaining of the filthy state of the Railway stations between Madras and Coimbatore, and advertng especially to the Vellore station, the state of which, Dr. Day observes, ‘was disgusting in the extreme.’ To the state of this station, Dr. Day attributes the circumstance to two of his servants, who slept there on their journey to Madras, having been attacked with cholera, which, in one case, terminated fatally.

I F



In March last year, the Consulting Engineer was directed to report on the nature, extent and condition of the accommodation available for all classes of passengers at the principal stations along the lines of the South-West and North-West Railway, the state of the waiting rooms, ladies' rooms, privies, urinals, furniture, &c.; and on the 1st of the following month, Captain O'Connell submitted a report, in which he brought to notice various defects in the condition of several of the stations. He was subsequently directed to inspect the stations along the line six months later, and to report whether the deficiencies pointed out by him had been made good. This report has not yet been furnished; and the Governor in Council directs that either the Consulting Engineer or his Deputy will proceed as soon as possible to the several stations on the two lines, and furnish Government with a full report as to their present condition and also as to the state of the adjoining ground, villages, &c., with special reference to the alleged want of cleanliness. The Principal Inspector General of the Medical Department will depute an experienced Medical Officer, to accompany the Consulting Engineer, or his Deputy, for the purpose of examining the sanitary condition of the several stations named in Captain O'Connell's report of the 1st April last, and suggesting such alterations and improvements as may appear to be requisite. The report now called for should be submitted with as little delay as possible."

The Agent and Manager of the Madras Railway questioned the correctness of Mr. Day's assertions, but, at the same time, we must add, expressed every willingness to remedy any real nuisance which might be found to exist.

Mr. Elwin's letter to the Consulting Engineer and, the letters of the Traffic Manager and the Physician to the Railway are too important to be omitted.

### (III.)

From R. B. ELWIN, Esq., Agent and Manager, Madras Railway Company; to Captain P. P. L. O'CONNELL, R. E., Consulting Engineer for Railways, dated Madras, 16th January 1864, No. 39.

In the *Madras Daily News* of the 8th instant, there appeared an article, in which it was stated that a Civil Zillah Surgeon travelling to Madras by rail had two of his servants attacked by cholera, and that he was under the conviction that their illness was entirely occasioned by the dirty and neglected condition of the station at Vellore.

2. So serious a statement demanded special attention, and I at once communicated\* with Mr. Dartnell,

\* No. 6, 8th January (copy enclosed.) the Acting Traffic Manager, who was then upon the line, directing him to stop at Vellore on his way to the Presidency, inspect most carefully

the waiting-rooms, urinals, &c., &c., and report the result officially to me.

3. Before I received Mr. Dartnell's report, I read in the *Madras Times* newspaper of Monday, the 11th of January, a letter addressed to the Editor by Mr. Francis Day, the Civil Surgeon of Cochin, commenting in very strong language upon the disgusting state of the stations between Madras and Coimbatore, but more especially Vellore, at which he had no doubt cholera was contracted by two of his servants, one of whom, the ayah, unfortunately died.

4. After reading this letter, I again communicated \* with the Acting Traffic Manager, and determined

\* No. 7, 11th January (copy enclosed.) personally to inspect the stations as far as Tripatore in company with Dr.

vanSomeren, our Consulting Physician, and for this purpose left the Presidency on Thursday morning.

5. I have now the honour to ask the Honorable the Governor in Council to peruse the accompanying reports from the Acting Traffic Manager and Dr. vanSomeren, dated respectively the 13th and 16th instant, both of which tend to refute the statement put forth by Dr. Day.

6. The result of my examination certainly combats the report which has gained circulation, and I am exceedingly glad to know that the Government have deputed a Medical Officer to accompany you or Captain Lindsay, for the purpose of examining the sanitary condition of the important stations upon our two lines of Railway. I shall therefore take no further action until the inspection has been completed.

7. I am continually about upon our lines, and must say that I have not yet found a station in the state that many are represented to be in by Dr. Day.

8. Captain Lindsay and yourself have frequently, during the last six months, travelled upon the Railway, and I think it is only reasonable to suppose that if our stations were in the disgusting condition represented by Dr. Day, so serious a matter would not have escaped your attention.

9. That there is much room for improvement in many details, I readily admit, but it strikes me that it is too much for any one to assert that cholera was contracted at any given station, unless that scourge was prevailing at the time which is known not to have been the case at Vellore, where only one instance of cholera has occurred during the past three months.

10. The Government are fully aware of the extent to which our stations are used by the public, and that the waiting, refreshment, and bath-rooms at Coimbatore, Salem, Tripatore, &c., &c., are nightly occupied as sleeping apartments, which circumstance en-

hances very materially the difficulty under which we labor in keeping such places clean and wholesome. I may add that in England such a state of things would not be tolerated for one moment, and it was this which induced me to advocate so strongly the building of hotels and choultries at our principal stations.

11. The recommendations contained in Dr. vanSomerens's report shall receive immediate attention.

12. I will ask the Honorable the Governor to be kind enough to allow these communications to be placed upon the Editors' table.

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(IV.)

From R. B. ELWIN, Esq., Agent and Manager of the Madras Railway Company ; to the Acting Traffic Manager, dated 8th January 1864, No. 6.

In this morning's issue of the *Daily News* there is a severe article upon the condition of the Railway station at Vellore, and as you are now out upon the line, I must ask you to be good enough to inspect minutely the urinals, waiting-rooms, &c., &c., at that station, reporting the result officially to me.

2. You will observe from the annexed extract which has been copied from the article in question, that a Civil Zillah Surgeon travelling to Madras by rail had two of his servants attacked by cholera, and that he states his strong conviction that their illness was entirely occasioned by the very dirty and neglected condition of the station at Vellore.

3. This is a most serious statement for any one to make, and it comes with more force from a medical man. It therefore behoves you, as immediately entrusted with the working of the line, to be most particular in your investigation, and careful in your report to me.

4. Cleanliness in this country is a matter of vital importance, and strict regard to sanitary measures cannot be too strongly enforced upon all Station Masters and District Inspectors.

(True Copy.)

(Signed) R. B. ELWIN,  
Agent and Manager.

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V.

From G. DARTNELL, Esq., Acting Traffic Manager ; to the Agent and Manager, dated Madras, 13th January 1864, No. 10.

Mr. Day's letters in the *Madras Times* and *Daily News*, your numbers 6 and 7, 8th and 11th instant.

2. I was very much surprised to the articles in the Madras newspapers of the 8th and 11th instant, and more especially at Mr. Day's

letter, and after thoroughly investigating the case, I do not hesitate to say that the complaint against Vellore station is without foundation.

3. The first intimation I received of the "article" of the 8th was by your letter of that date, which was delivered to me on the 9th, whilst on my way to Madras, and in coming down I stopped at Vellore for the purpose of examining the station and inquiring into the complaint. In looking over the premises I found, as I always have found, the waiting rooms, officers' platform, urinals and compound in a neat and clean condition. I may mention that the Station Master had no previous knowledge of my visit, as I travelled by a Special Goods' Train.

4. On the 1st October last I appointed District Inspectors or District Station Masters, whose duty is to travel between certain stations daily, and to keep me advised of any irregularity.

Copy enclosed.

These Inspectors, in addition to their daily reports, fill up weekly a printed form in which they state the condition of the several stations on their district. In the reports from the second District (Arconum to Tripatore), for weeks ending the 2nd and 9th instant, the Inspector remarks:—"I visited the stations in my District on Friday last, and all the buildings are kept clean." Besides the general instructions to Station Masters, as contained in the Company's Rules and Regulations, I have, during my tenure of office, issued special instructions to the Inspectors, calling attention to the importance of keeping the stations, and especially the urinals, clean. The following is an extract from a Circular addressed to Inspectors, dated the 2nd instant:—"Be careful to see that the buildings and premises are clean and in good order, the platforms swept down and watered immediately before the arrival of each train, the offices tidy and in good order, the urinals and retiring-rooms thoroughly clean and well watered, and the waiting-rooms properly attended to."

5. The Station Master at Vellore, and also the Station Inspector of the District, are both high caste men, and have always been distinguished for keeping their stations in good order.

6. The Company's Apothecary in charge of Vellore Station positively denies the statements contained in Mr. Day's letter with regard to the dirty state of the station, and mentions that there has been but one case of cholera during the last three months, although in the bazaars and villages within a few miles of the station there have been numerous cases and several deaths.

7. In conclusion, I beg to add that my chief Clerk, Mr. Sale, who travelled from Madras to Coimbatore by the 6-15 train on the 4th instant, inspecting stations (the same morning Mr. Day started from Vellore), reports Vellore station "clean and in good order." Mr. Sale has had 17 years' experience on Railways in England, hav-

ing been in charge of important stations on some of the leading lines, and I think his testimony in this case deserves particular consideration.

(True Copy.)

(Signed) R. B. ELWIN,  
*Agent and Manager.*

## VI.

From W. J. VANSOMEREN, M.D., Consulting Physician, Madras Railway; to the Agent and Manager of the Madras Railway Company, dated Royapooram, 16th January 1864, No. 152.

Having yesterday inspected the stations and privies between Arconum and Tripatore inclusive, I have the honor to report the result of that inspection.

2. All the privies, with the exception of Arconum and Arcot, were scrupulously clean, and as the former were examined shortly after the arrival of the North-West train in the morning, they were not more soiled than was to be expected. The privy at Arcot was not so clean as most of the others, but still much less polluted than might be expected in a place to which natives as well as Europeans have access. The waiting-rooms and privies at Vellore were remarkably clean and pure, and their condition unexceptionable.

3. Having said so much in favor of their condition, I beg to urge the inexpediency of having the same necessities for both Europeans and natives. The latter are so filthy in their habits that a privy to which they resort must, even with the greatest care and attention, prove disgusting to the former. The present places might, with some more openings for the access of air and light, do very well for Europeans and East Indians; but new ones should, in my opinion, be constructed for natives; and for the maintenance of cleanliness in all of them, I beg to recommend a flooring of asphalte, which should daily be covered with dry sand that can be easily removed by the toty, together with the droppings which soil it, as often as those droppings are deposited. The latrines for the natives had better not be covered at all, and they should be divided so as to serve for men and women.

4. The urinaries for Europeans should be floored with granite or asphalte, and furnished with vessels covered on the inside with coal-tar, while a supply of coal-tar had better be kept in an open vessel in each compartment as a disinfectant. The practice of washing urinaries with lime ought to be discontinued.

5. I discovered that there is but one toty to every two stations. This arrangement appears objectionable, as it is impossible for one man to attend to two privies so far apart satisfactorily. Each station should have its own scavenger.

6. There were collections of sweepings in some of the enclosures of the stations, and I beg to suggest the *daily* removal of such, so as to keep all the Company's premises as clean as possible. The waiting-rooms also, as places of resort for a large number of people daily, would be better for white-washing, at least once in six months.

7. As one means of stimulating the parties concerned in maintaining a proper conservancy of the stations, I shall write directing the Apothecaries to visit every privy as well as station weekly, and report the result of his inspection.

W. J. VANSOMEREN, M.D.

(True Copy)

(Signed) R. B. ELWIN,  
*Agent and Manager.*

The following reports by Captain Lindsay and Dr. Mackay prove that there was serious ground of complaint as to the want of cleanliness of some of the more important stations, as Coimbatore, Salem, and Vellore, and we trust that constant attention may continue to be given to the proper sanitation of these important resting places.

#### VII

FROM Captain J. G. LINDSAY, R. E., Deputy Consulting Engineer for Railways; to Capt. P. P. L. O'CONNELL, R. E., Consulting Engineer for Railways, dated Madras, 26th January 1864, No. 4.

I have the honor to report that, in accordance with the instructions contained in your letter, No. 6 of the 15th January, I have inspected all the principal stations on the South West and North West Lines of the Madras Railway in company with Dr. Mackay, the Medical Officer nominated by the Principal Inspector General of the Medical Department, pursuant to Government Order, No. 18 of the 12th January 1864.

2. Before giving a detailed account of the state of the different stations, I will make a few remarks, which apply generally to all the privies and urinaries on the line.

3. The privies are, in almost every instance, close, dark, and badly ventilated; at some stations when the privy door is shut, there is absolutely no opening whatever for air or light; as long as this is the case, it is out of the power of Station Masters to keep the places clean. The rattan commodes which are provided are ill-suited for the purpose, and the number is insufficient; the fact of all classes of na-

tives being admitted to the privies is enough to prevent all chance of their being kept in that state of cleanliness in which first class passengers would like to find them.

4. The urinaries also are, in my opinion, faulty in construction, and totally inadequate to the requirements of the passengers, they are as a rule devoid of the means of effective drainage; and the chunam flooring (in itself unsuited for the purpose) not formed so as to ensure the running off of the urine.

5. At *Royapoorum* I found the correct amount of furniture, all in good repair, the ladies' room clean, but the walls much discoloured; the 2nd class ladies' room and gentlemen's room are being used for other purposes, and not available for the public. The privies and urinaries clean, boards indicating their position are being prepared; the station building generally was clean, but it is a pity that the walls do not admit of white-washing, as they are discoloured and dirty looking in many places. The station compound was as clean as the presence of so many carts and bullocks can be expected to admit of.

6. *Perambore*.—Two chairs and one commode wanting; the urinaries at this station were found to be clean, but in a position quite inaccessible to the general public; there are no privies. The ladies' room, and station buildings are much in want of white-washing; the ground in the vicinity of the station is excessively dirty, and within the enclosure filthy; the sweepings from the station are apparently thrown down close to the building. Natives seem to be allowed to sleep in the back verandah, which does not tend to increase the cleanliness of the station. I may here remark that the size of the platform at this station appears to be quite inadequate to accommodate the number of passengers, European and native, who make use of it.

#### NOTE BY CONSULTING ENGINEER.

The Railway authorities had it in contemplation for several years past to abandon the Perambore Station, and to have a station for passengers more in the heart of Madras, consequently expenditure at this station has been restricted.

Vide Observations, No. 208,  
dated 8th December 1862.

In August 1862, however, an estimate for Rupees 2,701 was sanctioned for a temporary timber platform, which has been put up.

(Signed) P. P. L. O'CONNELL,

*Consulting Engineer.*

7. At *Avady* the furniture was found correct, and the station clean. The remarks in paragraph 2 apply to the privies and urinaries at this, and all other stations, the fact of their faulty construction in the first instance rendering it impossible for them to be kept free from a smell more or less offensive.

8. *Arconum*.—I found two chairs wanting in the gentlemen's room, and the bath room attached applied to other purposes; the ladies' room was clean, and properly furnished, with the exception of two basins which were removed; the privies and urinaries clean, although they were not so on the occasion of my former inspection. The ground in vicinity of this station is clean, but care is not taken to remove the sweepings to a sufficient distance.

9. *Arcot*.—Two chairs were found to be missing; the privies and urinaries, besides being open to all the objections before enumerated, are placed in such a position as to be useless to passengers; the station buildings are tolerably clean; the south side of the Railway enclosure was found to be very dirty.

I do not consider the position of the privies, &c., to be such as to render the buildings "useless." That such is not the case is proved from the dirty state in which they were found by Dr. vanSomerén.

(Sd.) P. P. L. O'CONNELL,  
Consulting Engineer.

10. *Vellore*.—Furniture found correct, with the exception of two chairs missing from the gentlemen's room. The ladies' and other waiting-rooms and station buildings generally very clean; privies and urinaries were clean on the occasion of my visit with Dr. Mackay, but not so at the time of my former inspection, when they were extremely dirty. The enclosure on north side of Railway is very dirty, the sweepings of the yard having been allowed to accumulate, and remain on the ground for a long time past.

11. The stations of *Goriattum*, *Mailputty*, *Amboor* and *Vaniembady* were all found clean in every respect, the only exception being in the case of the ladies' room at the last named place, which was dirty when I first inspected it.

12. *Tripatore*.—One chair wanting; the privies and urinaries I found very dirty on the occasion of first inspection, but clean at the time of my recent visit. The Railway compound is far from clean, native huts and other buildings are allowed to be erected, around these much dirt must necessarily accumulate. Station buildings tolerably clean.



13. *Samulputty*.—Benches for natives not visible, privies clean, urinaries dirty, station buildings and neighbourhood clean.

14. At *Morapoor*, *Mullapoor*, *Morapooram* and *Shevaroy Hill* stations the privies, urinaries, &c. were found to be clean; the station buildings and ground in the vicinity also clean. On a former occasion I found the privies at *Mullapooram* and *Shevaroy Hill* stations very dirty, those at the former apparently being never cleaned.

15. At *Salem* I found three chairs and one wash hand basin wanting in the ladies' room; also the venetians of bath-room broken, the privies and urinaries clean, station buildings clean, but the compound dirty, and ground in rear of the station extremely dirty. At this station also I found a marked improvement in the state of the station, the privies and urinaries being far from clean when I first inspected them.

16. *McDonald's Choultry*.—Privies and urinaries quite clean, station buildings clean, neighbourhood of station not clean; the same observations apply to *Sunkerrydroog*, where also four chairs were wanting.

17. *Errode*.—Three chairs missing; privies and urinaries clean; station building require white-washing; the neighbourhood of the station is not clean, dirty huts being allowed within the enclosure. As this will become an important station on the junction being effected by the Great Southern of India Railway, it is important that the compound should be kept free from buildings of an objectionable description.

18. *Perandoray*.—Privies and urinaries clean; station buildings also clean; but ground in the vicinity of station dirty, irregular buildings allowed to be erected within the Railway boundaries.

19. *Watcullee* and *Avenashy* stations were found clean in every respect.

*Somanoor* was the same, with the exception of one of the privies which was dirty.

20. *Coimbatore*.—It is imperatively necessary that immediate steps should be taken with regard to this station, not only to remove the actual filth, with which it is at present surrounded, but to prevent a recurrence of present state of things, by providing means to ensure the requisite sanitary measures being carried out for the future.

21. It is the only station of the Madras Railway, the state of which I have found to be correctly described by Dr. Day's words ; but to it certainly strong terms are applicable, and strong measures are necessary to prevent serious consequences.

22. When with Dr. Mackay I found the privies and urinals clean ; but on former occasions I have always found them very filthy ; but the accommodation afforded to the public is so very inadequate and the buildings so particularly badly constructed, that it would be unfair to attach blame to the Station Master in charge.

23. The back verandah of the station has, on every occasion of my seeing it, been closely packed with sleeping natives, and the smell there most offensive ; there is no other place for intending travellers to go to, and humanity, as well as unwillingness to drive these passengers away, combine to induce the Railway authorities to submit to the nuisance. The Station buildings, as far as mere sweeping is concerned, are clean, but much in want of white-washing ; the furniture was found correct.

24. The ground within the Railway enclosure was dirty, and in many places filthy in the extreme, the crowds of natives congregated at the station having covered the adjacent ground with most noxious matter. Immediately outside the compound gate there is a collection of dirty and objectionable mud huts built in a low position, and without any means of drainage ; and on the south side of the station at a distance of about 400 yards there is a small village which is gradually encroaching towards the station ; it is described as a perfect hot-bed of cholera, and filthy in the extreme.

I was informed that five of the Railway employes or their servants have been attacked by cholera since 1st January, and ten within the last two months.

25. *Maddikerry* station I found clean in every respect, but the privies used for other purposes.

26. *Conjecode*.—Privies and urinaries clean, but the outside dirty, and neighbourhood generally untidy.

27. *Palghaut*.—Privies and urinaries clean ; ground in rear of station dirty.

28. *Purley*.—Urinaries in an unfinished state ; privies, station buildings and ground in the vicinity clean

29. *Luckadey, Wotapolliem, and*

30. *Shoranoor* stations were found clean in every respect, a room for ladies is being prepared at the last named place.

31. *At Puttamby and Cootipooram* the privies and urinaries were found dirty, and rest of the buildings clean.

32. *Tiroor, Tanoor and Perpengady* all clean.

33. *Beypore* station is at present in a state of confusion, as an upper story is being built for the purpose of an hotel ; the furniture I found all correct, and the privies and urinaries clean ; at this and the other large stations on the line there are no latrines for the native employes, which I think there ought to be.

34. On the North West line at *Tirutany and Naggery* I found the privies and urinaries, station buildings, and ground in the vicinity quite clean.

35. *Puttoor* station was also free from impurities, but the compound untidy, the drainage from the urinary is made to come out on the platform ; it is fortunately but little used.

The urinary is not the one sanctioned as per plan No. 202. It is one attached to the out-houses of the Station.

(Sd.) P. P. L. O'CONNELL,  
Consulting Engineer.

36. At *Poody* there are no privies or urinaries ; the station buildings and ground in the vicinity were clean.

37. At *Tiruputty* every thing was particularly clean, and the furniture correct.

38. I consider that at present the privies and urinaries are only sufficient for the accommodation of European passengers, and that if they are altered, proper attention paid to their ventilation and drainage, and natives excluded from them, the different Station Masters on the line will find no difficulty in keeping them pure. The walls of privies above seven feet should be perfectly open, all, or nearly all round, only sufficient masonry for the support of the roof being left ; small round holes, or bits of venetian shutters do not afford sufficient ventilation, and cells without any opening are unbearable.

39. The flooring of urinaries requires great attention, it should be formed of dressed stone, or, if under cover, of asphalte ; and one uniform and approved plan should be adhered to.

40. For native passengers latrines should be provided, as constructed for the native community in Madras by the Municipal Commissioners; simple walled enclosures, with a flooring of sand, well exposed to the deodorising action of the sun, is all that is necessary, the dimensions varying according to the number of passengers frequenting the different stations. The upper soil will have to be removed at stated intervals, but I do not think that much extra labor will be entailed.

41. The following Sweeper Establishment is maintained for purposes of conservancy :—

|   |                 |             |
|---|-----------------|-------------|
| 1 | Sweeper at..... | Beypore.    |
| 2 | do. at.....     | Coimbatore. |
| 1 | do. at.....     | Tripatore.  |
| 1 | do. at.....     | Salem.      |

All other stations have one sweeper between every two.

42. With regard to Coimbatore station I would recommend that immediate measures be taken for building the bungalow and choultry lately sanctioned, and that great care be taken in choosing sites for the same; at the same time a fixed plan should be adhered to, in the construction of the native buildings forming the bazaar, at the compound gate; their presence is unavoidable, and even necessary, but there is no reason why they should be allowed to become a nuisance; public latrines should be constructed outside the Railway boundaries.

43. When proper accommodation is provided for native travellers, there will be no reason for admitting them within the compound, except at the time of the arrival and departure of trains. I would also suggest the expediency of excluding carts and bullocks from the enclosure when they are not actually engaged in loading or unloading. If the Railway authorities are of opinion that these measures cannot be carried out, and that they are unable to prevent their premises being occupied by the public at all seasons, their only alternative is to maintain such a Conservancy establishment as will enable them to keep the ground within their boundaries clean, notwithstanding the difficulties they have to labor against.

44. There is no doubt but that complaints may with justice be made regarding the state of several of the stations on the line, but I have endeavoured to show that the evil lies in

the faulty construction of privies and urinaries in the first instance. On the part of the Railway authorities I know is every desire to ensure the comfort of travellers.

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From Surgeon G. MACKAY, M.D., L.R.C.P. ; to the Secretary to the Principal Inspector General, Medical Department, dated Saint Thomas' Mount, 26th January 1864.

With reference to the Proceedings of Government, Financial Railway Department, dated 12th January 1864, and extract from Orders by the Principal Inspector General, Medical Department, dated the 16th instant, I have the honor to report that, in company with Captain Lindsay, Deputy Consulting Engineer for Railways, I have visited the stations on the Line of Railway from Madras to Beypore and those on the North West Branch from Arconum to Tiruputty. I shall first state the sanitary condition in which I found each station, and then add some general remarks and suggestions more or less or applicable to all.

2. *Madras ; Royapoorum Station.*—The buildings require white-washing ; the yard latrines and urinaries were clean.

3. *Perambore.*—Public road immediately outside the station very dirty and offensive—from cattle and apparently sheep and goats having been allowed to remain there during the night ; also from the natives making use of the ground along the station wall as a latrine. Previous to the departure of the morning train, a number of natives were found sleeping in the verandah of the Station-house ; they had evidently been using the ground adjoining the house (within the enclosure) in answering the calls of nature ; it was filthy dirty and smelt most offensively ; the ground within the enclosure was altogether dirty and neglected—the sweepings from the Station-house being thrown carelessly about. The Station-house is greatly in want of white washing. The urinary is in an out-of-the-way-corner of the compound on the opposite side of the Line to that on which the trains stop, consequent perfectly useless as regards convenience of passengers. There is no latrine ; but one seat with a chatty is placed in a compartment of the urinary.

4. *Avady and Trivellore.*—Ground around the station, clean. Latrines and urinaries, clean.

5. *Arconum.*—Neighbourhood of the station, clean ; but

sweepings of the yard thrown on one side instead of being removed. The refreshment and waiting-rooms clean ; but the bath-room attached to the gentlemen's waiting-room was locked up, being appropriated to some other purpose. The latrines and urinary to all appearance clean ; but smelt most offensively.

6. *Arcot*.—Yard, particularly on the south side of the station and specially near the latrines, filthily dirty ; Station house tolerably clean. The latrines and urinary to all appearance clean ; but the smell in them very offensive.

7. *Vellore*.—Yard on the south side of the station tolerably clean ; that on the north very dirty ; rubbish and filth in heaps—seemingly the accumulation of some time. Buildings, clean. Waiting-rooms, comfortable looking. The latrines and urinary washed out ; but walls dirty and smelling most offensively.

8. *Gooriatum*.—Station-house, clean ; also the ground around. Latrines and urinary seem little used.

9. *Mailputty, Amoor and Vaniembaduly*.—Ground and buildings, clean.

10. *Tripatore*.—Yard on the south side of the station seemingly used as an encamping ground and very dirty. Station-house, clean. Latrines and urinary, smelling offensively.

11. *Samulputty*.—Station-house and vicinity, clean. Latrines and urinary, tolerably clean.

12. *Morapore, Mullaparum and Shervaroy Hills*.—Station-houses and vicinity, clean ; also the latrines and urinaries.

13. *Salem*.—Ground behind the Station-house, very dirty. Waiting-rooms clean ; also the latrines and urinary ; but the latter offensive.

14. *McDonald's Choultry*.—Ground around rather dirty and neglected looking ; latrines and urinary very clean—seem little used.

15. *Sunkerry Droog*.—Ground around the station-house, dirty. Station-house, clean ; latrines and urinary look very clean—the floors being freshly white-washed ; but the smell in them was very offensive.

16. *Errode*.—Ground at the back of the station house, very dirty. Native huts erected on it. Station-house, clean. Latrines and urinary, tolerably clean.

17. *Perunduray*.—Ground behind the station-house, dirty—some objectionable native huts close to the station-house. Latrines and urinary, clean.

18. *Watkallee and Avenashy Road*.—Ground around and buildings, clean.

19. *Somanoor*.—Ground around, clean, latrines, dirty; urinary tolerably clean.

20. *Coimbatore*.—The state of this station may truly be said to be "disgusting in the extreme." The ground around the enclosure is very dirty. A native village is rising immediately outside the gate on the Coimbatore side of the station; it consists already of a considerable number of miserable huts built on a low swampy ground without any basement whatever; the inhabitants make use of the ground along the outside of the hedge round the compound as a public latrine rendering it most offensive. On the opposite side of the enclosure there is another native village of miserable huts—a few of which I understand have existed for some time; but I was informed that they are increasing in number and gradually approaching towards the station; there is no attempt at cleanliness about them, and the offensive smell from that direction is complained of by the Railway officials. The filth outside the station boundary is quite equalled by that within it. A large number of native travellers sleep in the verandah at the back of the station-house—there being no other accommodation for them; they use the compound freely in attending to the calls of nature, rendering it quite unsafe to walk out at the back of the Station-house; and in the morning the smell even in the verandah was most disgusting and sickening. There was also a collection of filth in the compound from bullock-bandies being allowed to congregate there. The refreshment and waiting-rooms were tolerably clean; also the latrines and urinary, but the smell in the latter was very offensive. The accommodation at this station, both for Europeans and natives, is very insufficient—being the place where trains from the east and west arrive in the evening and remain for the night, and also the station where passengers to and from the Hills remain. The station is certainly most dangerous to travellers in its present neglected sanitary condition. Cholera has lately been prevalent in the neighbourhood; it has visited the two native villages above alluded to; and during the present month five native servants of the Railway officials residing within the compound have been attacked.

21. *Muddikurry*.—Ground and buildings, clean—the latter seem little used.
22. *Conjecode*.—Ground around the station, dirty ; buildings clean—seem little used.
23. *Palghaut*.—Ground around the station, dirty ; latrines and urinary very offensive.
24. *Purley*.—Ground around the station, clean ; latrines, clean ; urinary seems to be unfinished.
25. *Luckady*.—Ground around the station, clean ; latrines used for other purposes ; urinary, dirty.
26. *Wootapollium and Shoranoor*.—Ground around, and buildings, clean.
27. *Puttamby and Cootipurum*.—Ground around, clean ; latrines and urinaries, dirty and offensive.
28. *Tiroor, Tanoor and Perpengady*.—Ground around, clean ; latrines and urinaries, clean.
29. *Beypore*.—Ground around, tolerably clean ; station house in confusion, from building going on ; latrines and urinary, clean in appearance but offensive.

*North West Line.*

1. *Terutany*.—Ground around station-house, latrines and urinaries—all clean.
2. *Naggery*.—Ground around and buildings, clean.
3. *Puttoor*.—Ground around station-house, latrines and urinaries, all clean ; but the last so badly constructed that the contents run out on the surface of the ground at the end of the platform.
4. *Poody*.—Ground and station-house, clean. No latrines nor urinaries.
5. *Tiruputty*.—Ground around station-house, latrines and urinaries—all clean.
6. It must not be supposed that the state of cleanliness in which many of the stations are reported as having been found is the usual condition in which they are kept. I am quite sure it is not ; in some instances the latrines and urinaries found clean on my progress westward were quite the contrary on my return ; at some stations the yards were being swept up at the time of inspection ; and the rubbish being collected was evidently the accumulation of some time.



7. The want of suitable accommodation in the neighbourhood for native travellers is a fruitful source of filth about some of the station houses ; they sleep in the verandahs at night, and make use of the compound in answering the calls of nature ; the latrines and urinaries are totally unsuited for them ; at the larger stations quite inadequate for their numbers ; and when they do make use of them it is not in the European fashion for which they are intended ; but they sit down on the floor according to their custom ; and when water is used for cleansing these places, solid as well as fluid excrement is washed out to pollute the soil around. At many stations the native passengers may be seen leaving the carriages in much larger numbers than the present latrines and urinaries can possibly accommodate ; there seems to be no attempt made to restrain them in their shameless habits ; they may be seen sitting down on the ground at the nearest convenient spot, or even on the platform itself !—this is not altogether to be wondered at—for there is really no accommodation for them, and the Station Masters being generally natives themselves, are not alive to the injurious consequences likely to result. At a few stations there are conveniences intended for native females only ; but these are as unsuitable as those for the males. Suitable latrines for men and women separately should be provided at the stations chiefly resorted to by natives ; these need not be expensive—merely an enclosure with a wall sufficiently high to ensure decency and without any roof ; the floor should be made of granite, well rammed clay, or other impermeable material and covered with sand—which should be removed and renewed daily. The strictest watch should be kept to prevent the native passengers from using any other place. The latrines and urinaries throughout the line are very faulty in construction for the use either of Europeans or natives. The latrines are generally dark ; some are totally devoid of ventilation ; and nearly all the others are deficient in that respect ; the conveniences in them are too few and unsuitable ; they are generally baskets which require the most scrupulous attention to preserve them clean. I would recommend that the latrines should be thoroughly ventilated, and provided with wooden seats and glazed earthen warepans. The flooring of the urinaries is generally made of brick and chunam, also the channel which is very objectionable, as the acid in the urine combines with the lime and forms a most offensive com-

pound which no amount of washing can remove, and which is the cause of the offensive smell in many of these places even though to all appearance clean. Asphalte would answer well for the flooring of the latrines; but the urinaries being open large slabs of granite would be preferable, as asphalte cracks and breaks when exposed.

8. Two or three different plans in use for getting rid of the urine; the most common is to allow it to run through a hole in the wall and expend itself on the surface of the ground, as already stated with the native habit of using these places, it is not fluid alone which is thus washed out; another plan is to conduct it into a drain which is cut for a few feet under ground, and thus it is allowed to be absorbed into the earth; at the Coimbatore station a covered channel of this description carries it into a pit dug for the purpose only a few feet distant from the building. These plans are all bad, tending to saturate the soil in close proximity to the Station-houses, which must sooner or later prove injurious. Undoubtedly the best plan would be to have no channel at all, but to use iron vessels as urinals to be emptied into a larger covered vessel kept outside; another covered vessel of the description should be kept for the latrine pans to be emptied into, and both should be removed once or twice a day to a convenient spot at some distance from the station and there emptied—the liquid into a well dug for the purpose, and the solid into a trench. These vessels may all be kept free from offensive odour by being painted inside and out with coal tar to be renewed twice a week or oftener if necessary. I would recommend that the walls of the present urinaries should be scraped so as to remove all the plaster, and that they should then be made smooth if necessary with a plaster of mud painted with coal tar, and the use of lime prohibited. With these alterations the present latrines and urinaries would be amply sufficient for European and East Indian passengers. The present Scavenger Establishment, as far as I could learn, is very deficient. There is one toty only at each of the larger stations—except Coimbatore which has two; but they are not restricted to the duty of the public station-house only. There is but one toty for every two of the smaller stations. It is desirable that the verandah at most of the stations should be prolonged; it covers only a small space, and the latrines and urinaries being placed at the end of the platform, neces-

sitates a walk of some distance in the sun, which is objectionable for Europeans and particularly for invalids.

9. The cleanliness, particularly of the ladies' waiting-rooms, might be better secured by a female attendant being entertained for each, whose special duty should be to see that they are kept clean and not made use of by any but the passengers for whom they are intended. This would add greatly to the comfort of lady travellers, and such a person might be procured for a very small salary at each of the principal stations, as it might be made known that passengers are expected to pay her which would also have the effect of making her more attentive. There is one such servant at the Coimbatore station. It would be very desirable to prevent cattle being picketed at night within the compound of the stations—a suitable place might be provided for them outside, and cleanliness enjoined. The sweepings of the yards are at present I believe disposed of under a contract, and surely there should be no difficulty in making their frequent removal a part of the bargain.

10. Whatever trouble may be taken to preserve the station-houses and their vicinity to all appearance clean, it is very certain that the present state of matters must lead to very deplorable results; the ground around each station is becoming saturated with filth—the baneful effects of which must sooner or later show themselves, and when they do it will be too late to attempt a remedy—the consequences must either be endured or the locality abandoned; the subject is therefore one of paramount importance. A long Railway journey, extending over some hours during the heat of the day in this climate, is very fatiguing; the passenger reaches the end of it exhausted, and consequently predisposed to be affected by morbid influences which makes it the more necessary that sanitary precautions should not be neglected, which they certainly are at present.

11. Prickly Pear has been planted to some extent to mark the boundary line; it is desirable that it should be rooted out at once. A narrow strip of this plant cannot be very injurious; but it is impossible to prevent the seeds being scattered about, and it spreads so very rapidly that in a few years it will be most difficult to eradicate it.

The Government issued the following order on the foregoing on the 2nd February, No. 62:—

The foregoing papers contain the reports of the Deputy

Consulting Engineer and of Surgeon Mackay, on the sanitary condition of the Station-houses of the Madras Railway, which they inspected in pursuance of the orders conveyed in the Proceedings of Government under date the 12th ultimo, No. 18.

2. These reports show the urgent necessity that existed for the careful inspection which has now been made. It appears that the urinaries and latrines throughout the line are faulty in their construction and unsuitable for the use either of Europeans or natives. They are generally ill-ventilated. The conveniences in the latrines are too few and are unsuitable; and in the urinaries, the materials of the flooring are ill-adapted, and, when saturated with urine, give forth an offensive smell which no amount of washing will remove. At many of the stations, the size and number of the urinaries and latrines are insufficient for the number of passengers who require to use them.

3. At some stations, the ground around them is kept in a very dirty state; and native huts have been allowed to be erected objectionably near the station-house. There is a great want, at some of the more important stations, of rest-houses or choultries for native travellers, who, in the absence of such accommodation, sleep in the verandahs and yards of the stations, and by their uncleanly habits, render them intolerably offensive. This is especially noticed with reference to the stations of Perambore, Arcot and Coimbatore. The following is Dr. Mackay's account of the last mentioned station:—"*Coimbatore*.—The state of this station may truly be said to be disgusting in the extreme. The ground around the enclosure is very dirty. A native village is rising immediately outside the gate on the Coimbatore side of the station; it consists already of a considerable number of miserable huts, built on a low swampy ground, without any basement whatever; the inhabitants make use of the ground along the outside of the hedge round the compound as a public latrine, rendering it most offensive. On the opposite side of the enclosure there is another native village of miserable huts, a few of which, I understand, have existed for some time; but I was informed that they are increasing in number, and gradually approaching towards the station; there is no attempt at cleanliness about them, and the offensive smell from that direction is complained of by the Railway officials. The filth outside

the station boundary is quite equalled by that within it. A large number of native travellers sleep in the verandah at the back of the station-house, there being no other accommodation for them ; they use the compound freely in attending to the calls of nature, rendering it quite unsafe to walk out at the back of the station-house ; and in the morning, the smell, even in the verandah, was most disgusting and sickening. There was also a collection of filth in the compound, from bullock-bandies being allowed to congregate there. The refreshment and waiting-rooms were tolerably clean ; also the latrines and urinary, but the smell in the latter was very offensive. The accommodation at this station, both for Europeans and natives, is very insufficient, being the place where trains from the east and west arrive in the evening and remain for the night, and also the station where passengers to and from the Hills remain. The station is certainly most dangerous to travellers in its present neglected sanitary condition. Cholera has lately been prevalent in the neighbourhood ; it has visited the two native villages above alluded to ; and during the present month, five native servants of the Railway officials residing within the compound have been attacked."

4. The filthy state of the Parcherry outside this station is specially brought to notice in the Consulting Engineer's letter of the 28th ultimo, with reference to a representation from the Railway Apothecary forwarded by the Agent and Manager.

5. The Governor in Council directs that copies of the Deputy Consulting Engineer's and Surgeon Mackay's reports be forwarded to the Agent and Manager, in order that effectual measures may be immediately taken to carry out Surgeon Mackay's very practical suggestions ; which, it is observed, though more full and detailed, are very similar to those made by Dr. vanSomeren in his letter of the 16th ultimo. The Consulting Engineer will impress upon the Agent the importance of immediate action in this matter and the heavy responsibility which attaches to the Railway authorities in a matter so seriously affecting the health of the public. Those stations which are the most frequented—such as Perambore, Arconum, Vellore, Tripatore, Salem and Coimbatore—should be first attended to. The Consulting Engineer will report fortnightly what progress is being made.

6. As regards the ground in the neighbourhood of the Coimbatore station, the Governor in Council directs that the Collector will report what steps he has taken to remove the nuisance referred to in the Consulting Engineer's letter of the 28th ultimo. On the 25th November last, Mr. Grant was directed to have the ground in the neighbourhood of that station frequently inspected and kept free from nuisances. From the facts stated in the Apothecary's report, it would appear that these instructions have been neglected. The Governor in Council will expect to receive a full explanation on the subject from the Collector. The Parcherry at the gate of the station should be at once removed; and no time should be lost in erecting choultry for native travellers in the neighbourhood of the station, as directed in the Proceedings of Government of the 25th November last. Orders on this subject will be issued in the Department of Public Works; and as similar accommodation is evidently needed at many of the more important stations, the Governor in Council directs that Captain O'Connell will report, in communication with the Agent, at what stations choultries are most wanted, and the extent of accommodation required. The necessary orders will thereupon be issued in the Department of Public Works for their immediate erection.

7. The Governor in Council directs, in conclusion, that a further inspection of the sanitary condition of the several stations shall be made in July next by the Consulting Engineer, or his Deputy, and Surgeon Mackay, if his services should then be available. If not, the Principal Inspector General of the Medical Department will nominate another Medical Officer for the duty. The Governor in Council desires that the thanks of Government may be conveyed to Surgeon Mackay for the efficient manner in which he has discharged the duties assigned to him.

## BOOKS RECEIVED.

- 1.—A Clinical Memoir on certain Diseases of the Eye and Ear, by Jonathan Hutchison, F.R.C.S.... J. Churchill, London.
- 2.—A descriptive List of Ceylon Timber Trees, by W. Ferguson, F.L.S..... Observer Press, Colombo.
- 3.—The Timber Trees, Timber and Fancy Woods, as also the Forests of India and of Eastern and Southern Asia, by Edward Balfour, L.R.C.S.E... Cookson & Co., Madras.
- 4.—On the Growth of the Recruit and Young Soldier, by William Aitken, M.D., Edin..... Griffin, Bohn and Co., London.
- 5.—The Progress of Ophthalmic Surgery, by John Zachariah Lawrence, F.R.C.S., M.B., Uni. Lon. Henry Mitchener, London.
- 6.—Deaths in Bombay during 1862..... Edn. Socy.'s Press, Bombay.
- 7.—Deaths in Madras during 1861..... Graves, Cookson & Co., Madras.
- 8.—Studies in Physiology and Medicine, by the late Robert James Graves, F.R.S..... J. Churchill and Sons, London.
- 9.—Report of the Conservator of Forests for the Official year 1859-60.
- 10.— Do. do. do. do. 1860-61.
- 11.— Do. do. do. do. 1861-62.
- 12.— Do. do. do. do. 1862-63.

## PERIODICALS RECEIVED.

The Lancet.  
 The British Medical Journal.  
 The Dublin Medical Press.  
 The Dental Review.  
 The Dublin Quarterly Journal of Medical Science.  
 The North American Medico-Chirurgical Review.  
 The American Journal of Science & Arts.  
 Braithwaite's Retrospect.  
 Ranking's Half-yearly Abstract.  
 The Medical Critic and Psychological Journal.  
 The Medical and Surgical Review (Australasian.)

Edinburgh Medical Journal.  
 The American Journal of Insanity.  
 The do. Journal of the Medical Sciences.  
 The do. Medical Times.  
 Transactions of Bombay Medical and Physical Socy.  
 The Pharmaceutical Journal. *2*  
 The Stethoscope.  
 The Canada Lancet.  
 Social Science Review.  
 Transactions of the Epidemiological Society of London.

THE MADRAS  
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MEDICAL SCIENCE

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AUGUST 1, 1865.

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PART I.

ORIGINAL ESSAYS.

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ART. VII.—*An account of the “Kolymullays,” one of the mountain masses in the Salem district of the Madras Presidency: to which are appended some personal observations regarding Climate, Fever, &c., with generalizations thereon.* By WILLIAM KING, Esq., Geological Survey of India.

THE southern part of the Salem District is agreeably diversified both as to climate and scenery by extensive mountain land, which forms a clustering outlier of the Eastern Ghats. In this cluster are the Shevaroy's, which are now very well known and appreciated; but the other mountains composing it are sufficiently lofty and extensive, in appearance at least, to have attracted the attention of residents and travellers in the neighbourhood, to the possibility of their being used as sanitarium, or areas of cultivation. Of these, the Kolymullays have generally been thought of next to the Shevaroy's, and as the latter mountains have already been described in this Journal by Mr. Cornish, it is thought that the following description of the general character and resources of the former may be of some interest, especially when taken in con-

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nexion with a previous notice of them by my colleague Mr. R. B. Foote, with whom I examined these mountains during our geological survey of the country in which they occur.

### PART I.

The Kolymullays, or, as they are sometimes called, Saduragiris, are situated about twenty miles S. S. E. of the town of Salem. They rise rather abruptly from the plains and look from any side, but especially from the west, like a flat-topped range of mountains. The upper surface is not, however, a flat and regular plateau, but rather an assemblage of deep narrow valleys among ridges and hills which lie inside the apparently level outer line of ridges.

The greatest height observed was 4,016 feet above the sea at the northern end of the mountains, where there is a high ridge just north of, or above, the village of Pylum. There is another high ridge at the southern end near the old bungalow, which may possibly be a few feet higher. The general elevation, however—that of the interior, or inhabited portion of the mountains—is about 3,500 feet above the sea.

As has been already observed the slopes of the Kolymullays are apparently abrupt in their descent, and they are so in reality on all sides except the north-eastern, which slopes gradually down by long valleys to the low country. There are two ghats or paths which are in general use among the people; one on the west side called the Chhindamungalum Ghat, leading from the village of that name situated above six miles north-east of Namcul Droog. This being on perhaps the steepest side, is the shortest but most difficult path. The other is a bridle path, or rather is good enough for that name, and ascends by the Mooloooordry valley on the north-east side, but it is naturally a long road and is besides difficult to be got at.

In shape, the upper surface is an irregular figure, having a broad rounded southern end with a narrow prolongation from this to the north-west. A water-shed just separates the one end from the other, and nearly all the streams of the broader and southern end flow together to form the only large stream on the mountains, which falls down to the low-country by a gorge on the east side opening into the Toriore valley. The streams to the north of the water-shed are small, and cross the elevated edge of this part of the mountains by two or three small ravines. The upper sur-

face is about seventeen miles long, and the greatest width of about eight miles is attained in the southern half; but owing to its irregular configuration, the actual length, breadth, and superficial extent are greater than might be expected.

In general appearance the top of the mountains is not unlike that of the Shevaroy, or parts of the Nilgiris in the neighbourhood of Kotagherry (the "Orange Valley" for instance). The country is covered with short coarse grass, out of which occasionally bare spreads of grey rock show, while there are beautifully wooded dells in the bottoms and heads of the valleys, and low scrub-jungle on the more exposed hill sides. There are occasional patches of forest along the sides of the valleys of the northern and narrow half of the range, and thick forest jungle extends down some of the ravines leading to the low-country. The accounts of the inhabitants, and evidences which still remain, show that the forest patches of the upper surface were, however, formerly much more frequent and extensive. In one place the bare trunks and stumps of trees which had been blasted, or nearly all blown down by a hurricane some twelve or fourteen years ago, show that there must have been a good sized forest. The southern end of the mountains is the most luxuriant and picturesque in its vegetation, though there is a large rounded basin at the northern end which is very fertile, and wooded round its sides.

The most conspicuous trees are the "Jaks" (*Artocarpus integrifolius*), which are very large and fine-looking: one of these measured thirty-two feet round its trunk at two feet above the ground. This tree is very common all over the Kolymullays, and is quite a feature near every village with its grand massive outline and dark glossy foliage; but as a curious adjunct to the otherwise English looking character of the vegetation, there is the wild sago palm (*Caryota urens*), which here attains a fine stature, and is almost as striking in the scenery as the jak tree. The cocoanut palm, as well as some fine banyans, tamarinds, and bamboos grow down at Coiloorputty (the lowest part of the upper surface, about 3,000 feet) at the head of the wide gorge on the east side of the mountain.\*

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\* This is so low down and so easily approached from the low country without the pilgrims being exposed to too cold a climate, that a pagoda has been built here, and a pool bunded up, in which are preserved a lot of fish considered sacred on account of their tameness, and the presence of the cocoanut palms

The screw pine (?) (*Pandanus odoratissimus*) is very abundant along the low flats through which the main stream flows, and it may be seen here and there by the other streams as they flow under the denser clumps of jungle. This mountain form of the *Pandanus* differs somewhat from that commonly seen in the low country along the eastern coast of Madras, in so far as it is a taller and thinner stemmed plant: looking at a distance, in the river flats above referred to, like clumps of graceful and diminutive palms, while the low country form is a shorter stemmed and much closer-grown variety. There are of course numerous other trees which, as far as I could see, are the same as those growing commonly on the Shevaroy's: the above are only given as marked features on the upper surface. Formerly the teak tree is said to have been not unfrequent: but there was only one old tree shown to us as the last of the lot, this was at the northern end of the mountains. Just previous to our being shown this specimen, there must have been a good tree cut down, for at the village of Chittoor, we were camped close by a recently built framework for religious festivals which was made of the strongly smelling timber.

Of the mountain slopes, the long valleys opening down from the north-east side are most luxuriant in their vegetation, which is probably due to their catching a great deal of the moisture of the north-east monsoon. Indeed, from their length, gentle slope, and sheltered aspect, they would catch the greater part of any moisture which hung about the slopes. The western slopes, on the other hand, though exposed directly to the influence of the south-west monsoon as it comes travelling across from the funnel-like gorge of Palghat, are not at all so covered with jungle: and this may arise probably from the steepness of the mountain and the absence of any of those long sheltered valleys of the north-east side. There is also the fact\* of the jungles being exposed to a good deal of clearing from the wood cutters of that side of the Salem district.

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at any rate is no doubt due to their having been planted by the priests or pilgrims. This village is the resort of many people from the Toriore side of the country on certain occasions. The fish in the pool are so tame and so ravenous, that while I was standing looking at them, they came to the shore in shoals, and then wriggled themselves up in heaps with their bodies half out of the water, looking anxiously out for food. Probably there had been no pilgrims there for some time, for the few crumbs which the present pilgrim was able to give them, caused no end of fighting, and many a fish had a taste before the bread was finally gobbled up.

\* My attention was called to this by Mr. Foote.

The climate of this elevated region, as might have been expected, is a cool one, much like that of the Shevaroy's; only perhaps during the middle of the day in the hot months approaching the tropical. It is, however, except during four or five months in the year, prejudicial both to European and native constitutions: being for the remaining seven or eight months more or less feverish. In February it is quite as cold as it is in England during spring, and we found it necessary at that time to wear such clothes as we had used in the Nilgiris a month before; but in April, when we again visited the Kolymullays, we found warm clothes oppressive except at night or in early morning. While the sun is shining and one is exposed to its influence, the temperature is pleasantly warm, often a little hotter, but in shade or on a cloudy day it is cold; at sunset the bleakness of the scenery (owing to the want of warm tints in the absence of nearly all twilight) and cold were quite sufficient to drive us inside the tent or close to the blazing fire in front. In February thick fogs hung about the wet-cultivated grounds until some time after sun-rise; but these did not appear to have any malarious influence, probably because the water was in continual motion and not allowed to become stagnant.

The healthy season appears to commence after the north-east monsoon (heavy on these mountains), and lasts until the end of February: after this the hygienic properties of the climate are doubtful, while during some months jungle fever is prevalent.

There is no separate tribe of people dwelling on these mountains, as is the case on the Nilgiris, Annamallays, &c., neither do the inhabitants appear to be exactly like the Malyalays on the Shevaroy's; for they are scarcely distinguishable from the people of the surrounding low-country, either in language, habits, or dress. They are, however, much more sociable and hospitable to Europeans, though this may be only due to the fact of their receiving them so seldom. As a general rule, the people of South India inhabiting mountain regions are much more hospitable and sociable than their low-country neighbours, and, as far as we saw, these good qualities were not very plainly shown by our low-country friends.\*

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\* By the way I remember an incident which may also indicate a feature in the lives of these people not often seen among Hindoos. I was strolling along the side of a hill one day when I saw some distance in front of me, a man leaning by a rock, and wondered, as I walked along, at the man being in such a

The clothing of these people is almost as scanty as that of those in the warmer plains, but they live in much warmer huts. The little villages are generally situated in warm wooded glens, or they are scattered here and there in clumps of trees, among which, as a matter of course, the "Jak" and the "Sago Palm" are sure to be seen. Some are at the head of a valley or at the meeting of two or three valleys, and in such a situation, where the ground is not level, they are surrounded by terraced fields running along the sides of valleys; and the effect of these fields, with their crops in different stages of growth, some golden and others bright green, is most charming when taken into account with the shape of the ground and the clumps of trees. Then again, these villages are situated on alluvial flats, and have thin grassy meadows dotted also with groups of jaks and palms. But one of the prettiest features was that of the narrow lanes hedged in with high shrubs overgrown with thick creepers, which connected some of the villages, particularly in that part of the southern half of the mountains which is reached by the Chhindamungalum Ghat. The huts are crowded together, four or five to a village, and are built of "wattles and dab" with a good thick thatching; while close by is the enclosure for the buffalos and other cattle.

The Kolymullays are rather thickly populated, and for the small area are perhaps more so than either the adjacent Shevaroyes, or Koleroyes, or even the Nilgiris; as a consequence too they are perhaps more extensively cultivated. Indeed, as bearing on this, there is the almost total absence of game of any kind except an occasional hare, or partridge, and though the slopes are frequented to a small extent by cheetahs, bears, deer, &c., there is scarcely an instance of the appearance of any of these animals on the upper surface remembered by any of the inhabitants.\*

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solitary place and staring in that steadfast way down at the scenery. I got up to the rock without disturbing him. On looking round it, I saw what looked like a very pretty pastoral scene, not that there were any shepherds and shepherdesses like those we read of in English poetry—only an Indian shepherd standing by the rock and looking down in laughing talk at a young woman who was leaning with her chin on her hands and gazing up at his face. They answered my question concerning the path very civilly, and the girl stood by the man's side as I went on my way.

\* The great yellow "Hornbill" lives among the larger trees: but is not very common. I have seen the same birds on the Annamallays, where they make a most alarming noise with their great wings when a flock is roused out of the tree tops. I had not wandered far over the Kolymullays when I was startled by the well-remembered croak and flapping of the great wings, and on looking up there was the big bird soaring away.

The main occupation of the people appears to be the cultivation of grain and the rearing of sufficient cattle to manure the land; while the fruit of the jak tree is largely grown. The principal grain is Indian wheat, which is like barley, and in the bringing forward of this crop the people show themselves to be very skilful agriculturists.

It has been already noticed that the upper surface of the mountains is one which is cut up by numerous narrow and deep valleys, without any extensive level surface; and therefore it is a country the configuration of which renders the cultivation of the ground, especially where water is so necessary to this end, a work of some trouble. The bottoms and sides of the numerous valleys are the areas of cultivation, and these have been skilfully arranged in terraces so as to make the most of the water which comes from the higher grounds. The same system has been adopted in some of the villages of the Shevaroy, but not nearly to such an extent. This arrangement of the cultivated ground in terraces looked most curious and pretty, with their fine crops of wheat and other grain in nearly every stage of growth.

The finest example of this mode of cultivation and irrigation occurs in the only large valley at the northern end of the mountains, which may be called the Purracurrah valley. When looked down upon from the 4,016 feet hill already mentioned, the view is peculiar. This valley is of an elliptic shape, and all around the sides are arranged these terraces, looking like contour lines, encircling the irregular trifid figure made by the flats of paddy land lying immediately along the overflowing streams. In fact, the picture of the bottom of this valley is not at all unlike a contoured map of a system of valleys which has been prepared to show how this system might be turned into a great water reservoir. On such a map, the contour lines are delineated as concentrically encircling the bottoms of the valleys, and in this Purracurrah valley there is a rough view of a map of this kind.

Nearly every available piece of ground, according to the present supply of water, has been taken advantage of by the people, and this is perhaps one of the reasons why no attempts have been made to grow coffee on this elevated area. There is still, however, much available land which might be turned to use, besides what could be brought

under cultivation were the water supply preserved. At present too it must be remembered that the people only rear sufficient crops, or very little more than is required for their own wants.

In a geological way, there is not much of particular interest in the Kolymullays. They are almost identical in the character and constitution of their rocks with the rest of the hill ranges south of the parallel of Madras, being built up of very old metamorphic rocks of the same general kind as those of the surrounding low country; and they probably, if not certainly, owe the preservation of their altitude to the fact of their being made up of the harder and more intractable varieties of these rocks.\*

These mountains, then, are mainly built up of nearly vertical beds of massive syenitoid gneiss. All the beds of rocks are, however, not of the same composition, gneiss being liable to have one or two of its constituent minerals preponderating over the other two or one as the case may be; but they are generally either of compact massive quartzo-felspaltic or quartzo-hornblendic gneiss, with occasional traces of igneous rocks and quartz veins. There are one or two thick beds of a highly ferruginous quartzose gneiss, one of these occurring at the south end of the mountains above the ruined bungalow, but the rock is too hard and intractable to be of any value as a source of iron.†

Besides these, there are among the other beds occasional ones of garnetiferous gneiss (a common rock also on the Nilgiris and Shevaroyes): but the garnets are very small and well scattered through this very hard variety of rock.‡

\* The low country around, on the other hand, is made up of other varieties of the metamorphic rocks which are not so uniformly hard and massive, along with which occur many of the schistose forms; and, as a consequence partly of this constitution, the country has been worn down into the form of the low-lying plains which we see.

† Down in the low country where these beds again appear, being continuous across great areas, the ore may easily be collected, because the very powerful disintegrating influences of the climate have got at the rocks and rendered them much more easily workable.

‡ Here also, the garnetiferous beds are, some of them, continued down the mountain slopes and so into the low country, which gives another instance of the powerful atmospheric agents at work in those regions, for parts of the plains as well as many of the beds of the watercourses are often tinged of a red color, owing to the quantity of garnet sand derived from the weathered rocks. In such case, the garnets, though small and broken, come to have a small value and are used as a polishing agent by jewellers, &c.

Such are the principal rocks, but there are a few characteristics belonging to them which are worthy of description, as bearing on the structure of the mountains. It has been hinted above, that the existence of such mountains as these rising out of the plains of India, is due, in a certain measure, to the hardness of the rocks composing them. Their form is also to some extent due to the other characteristics above referred to, viz., to "Bedding" and "Jointing," or as it may be better put, "Foliation" and "Jointing."

"Foliation," which is one of the distinctive characters of the gneiss rocks, is shown by the streaky markings and furrowings which are generally seen on the surface of the rock, these markings or furrowings just show the old stratified structure of the rock, and are the edges of planes along which the rock is inclined to fracture, or lines of weakness. On the Kolymullays these lines, or the foliations run in a general N. E., S. W. direction.

"Jointing" is the property which rocks have of splitting up in certain planes, and these planes in the present case are nearly vertical, but run in two directions, viz.—N. N. W., S. S. E. and E. N. E., W. S. W., with occasional variations.

The three lines, one of foliation, and two of jointing, are those which have mainly given form, not only to the outline of the mountain-mass, but also to the valleys of the slopes and upper surface. The outline is parallel to these lines, or, in other words, the slopes of the mountain have been worn away or denuded along these lines of fracture; while the main valleys of the upper surface, as well as those long ones on the north east side, are along the line of foliation, that is, in a line of least resistance and along which denuding influences, &c., would at once act and make ravines for streams to flow down by.

Besides the main geological features already described, there are two more which may strike the attention of a traveller.

Upon the top of the mountains, there is a decomposition of the rocks going on, which is brought about by the coldness and moisture of the climate, and the result is the formation of a lateritous rock, or a hardened ferruginous sandy clay of a red or reddish brown colour, something like laterite. This rock is not laterite, however, such as is known to occur on the west coast, or at the Red Hills near Madras, &c. The latter is a regularly deposited aqueous rock, having been



carried originally from a distance; while the lateritous rock of the Kolymullays, Shevaroyas, and Neilgherries, is one which has been formed on the spot, or nearly so, from the decomposition of the rock *in situ*. Such has been the case on the top of the Kolymullays, where some few of the tops of the ridges and other elevations are capped, as it were, with patches of this derived rock. The hornblendic varieties of gneiss in such localities have become decomposed to a certain extent, whence the iron, and an apparently new rock has been formed; or the ferruginous clay has been washed down for short distances by the rains and has become hardened over the rock or gravel on which it lay. Very often the folia or remains of layers of the more durable quartz, are still left in the derived rock; the other constituents of the original gneiss having become changed into the constituents of the lateritous rock.\*

The remaining geological feature worthy of note, is the occurrence of a number of small alluvial basins along the bottoms of certain valleys. These are now the centres of cultivation, only that they have been much extended by artificial means. The same kind of alluvial flats may be seen on the Shevaroyas, and again on the Nilgiris, where they are very many acres in extent. It seems strange to find such evidences of spreads of water where there are none such now; but when it is seen that nearly every one of these flats is backed up by a harder band of rock than that occurring over the rest of the alluvial area: it is easy to understand that these basins are just the sites of small lakes and swamps which were originally bunded up by these hard walls of rock. The streams flowing into and through these lakes, were continually bringing down sand and gravel from the higher grounds, and so gradually filled up these little reservoirs until they finally became land which lay nearly at a level with the top of the natural bund. The river under these new conditions ran over a flat of land instead of, as before, into a little lake, and worked its channel over and partly through the hard band of rock; leaving behind a useful bit of ground for

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\* I have written thus particularly concerning the lateritous rock, because people are often led astray by the misapplied term "Laterite." For instance, the hardened ferruginous sandy clay on the Shevaroyas is often called laterite, and the consequence is that the patches of decomposed gneiss (lateritous rock) occurring there, are taken as evidences that the greater part of the upper surface of those hills was once covered with a layer of true laterite. There is no evidence, however, to show this, the so called "laterite" of the "Green Hills" being merely decomposed gneiss.

man's wants, where otherwise he would have had hardly any. It just happens that wherever the larger valleys are lying across the direction of the foliation, or, in other words, across the beds of the gneiss, these alluvial flats have been formed in, because along such valleys there were opportunities for reservoirs of water being bunded back by the harder beds of rock, whereas, so soon as a valley runs N. E., S. W., or with, instead of across, the foliation, there is generally a clean run in the bottom for the stream.

## PART II.

A few attempts have been made at different times to find out how far the climate of these mountains might be advantageous to an European constitution, or to try if there might not be suitable ground for the growth of coffee. These have all shown, as far as the climate is concerned, that without very extraordinary precautions it is not beneficial; in fact, rather the opposite, except during three or four months in the year. With regard to the trials for coffee, nothing further was done by the explorers, I believe, than making a cursory examination; but as far as my own knowledge goes—having seen a good deal of coffee country and heard a good deal about it from both Ceylon and Indian planters,—I should not think that the country was very suitable for this purpose, mainly on account of the want of moisture,\* and partly because there is no good thickness of soil except over the areas already under native cultivation.

It is possible to get over this difficulty, though at some cost, as I have attempted to suggest further on; and if this

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\* It may not be out of place here to refer to the inadvisability of clearing away the jungle of these mountain ridges so much as has been done, particularly on the adjacent Shevaroya. I know that this very same statement has been several times made before both in the public papers and in many other ways, nevertheless there is no harm in reiterating it where the matter is such a serious one, viz., that the continually decreasing quantity of moisture on the Shevaroya as well as over the whole of the Salem district and its hill-groups, is mainly due to the clearing of the jungle. In 1857, when I first saw the Shevaroya, and I have seen them every now then since during the same seasons, the summits were often obscured by mist, which, though disagreeable at the time to the people in it, is wonderfully beneficial to not only the hills themselves, and indirectly to the people, but also to the country below. This occasional cap of mist is also a much more beautiful feature in the scenery than the nearly bare pyramidal masses of mountain starting out of the clear sky, so much oftener seen from Salem now than used to be the case formerly. In 1857, residents in Salem and in the Shevaroya were regretting the decreasing moisture, and the amount will only get less and less every year if the jungles are not allowed to grow.

were done the Kolymullays would be quite as good for growing coffee as the Shevaroyes.

Among the attempts which have been made for the above purposes are the following, which, by the way, are only those of which I could learn any thing from the people : but there have doubtless been other expeditions. A civilian of the Trichinopoly district is said to have built a small bungalow many years ago at the southern end of the mountains, which was resorted to probably during the most favorable season, as used to be a very sensible practice of our old collectors, when there was a cooler climate than that of the regular station within reach. This bungalow is now and has long been in ruins ; but a prettier locality, or one more seemingly devoid of any malarious influence could hardly have been chosen, lying as it does just below the outer edge of the mountain and overlooking all the country away to the southward. At the time of my visit the country was very dry and the great Cauvery which winds round here, as it comes down from Erode to flow away to the sea, was merely a broad yellow band bordered with the green of the cultivated grounds ; but when the river is down the view must be very fine. Right away south, lay the Madura district, and away west there was a great bank of clouds covering up the Annamallays, while in the hazy distance to the east I could just recognize Trichinopoly rock beside the river, looking like a squat little church with a squatter steeple.

A party of missionaries and planters made an expedition on one occasion some years before our visit to see if any thing could be done in their way ;\* but this visit ended unhappily, according to the account of the hill-people, in the deaths of nearly all the party from fever or causes brought on by exposure. Any missionary would, however, I feel sure, provided he could only get over the difficulties of exposure and fever, find the people a very pleasing set to deal with, and one which would listen to his teaching at any rate ; indeed, there would, as far as the place goes at present, be much more room and opportunity for a missionary than a planter.

Mr. Foote and I visited these mountains twice in the year 1860. The first occasion was in the month of February, when we ascended by the Chhindamungalum Ghat and camped at

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\* I believe Mr. H. Groves, of Mysore, was one of this party.

a small village near Vakalputty on the southern part of the mountains. The tents were pitched near some fine trees on a pretty grassy slope close to one of the alluvial flats, already described. This was mostly covered with water brought from the stream and adjacent pools by channels; but as the water was plentiful and in motion, there was a continuous murmuring as it poured into and out of the different paddy fields. We did not see any danger in being so near what appeared in the evening, from the fog hanging over it, like a bit of stagnant swamp.

During both visits it was cold, in February very cold between sunset and sunrise, and we were able to be out in the open all day long, though the direct influence of the sun was very powerful. I felt it less so in the valleys than out in the open, though equally exposed to the sun in either situation. Out on the breezy hill-side the skin dried up, and I felt an instinctive desire to get out of the sun's rays, while a slightly dull aching sensation would be experienced in the head; but down in the warmer valleys the skin became moist again, and I could trudge along as pleasantly as in England. I have experienced the same sensations (they are not uncommon with many other people) both on the Shevaroy's and Nilgiris, though at a much greater elevation and in a climate more generally like that of England: and it is not the pleasantest occupation to sit out in the sun on Dodabetta—sketching for instance—which is near 9,000 feet above the sea and quite as cold and bleak a situation as on any mountain side at home.

Taking, therefore, these sensations into account, it would appear that notwithstanding the cool and pleasant climate, it is hardly the most advantageous arrangement to be out in the sun all day on these mountains, or indeed on any of the elevated regions in South India, without some good protection for the head at least. Though occasionally clumsy, an umbrella is perhaps the best protection. The disadvantage in these elevated localities is, that the temperature of the air is not sufficiently high to produce that action of the skin which appears to be so essential during exposure to the direct rays of the sun. In the low country, on the other hand, it is this healthy action under a high temperature which enables the European to be out in the open so long as he usually is, especially those men who are engaged in a camp life, e. g., on the various survey parties. Violent exercise in mountain re-

gions is really the main reason why so many men are able to stand the sun with an ordinary covering to their heads, but even while undergoing this exercise and probably carried away by the excitement of the occupation—shooting or what not—sunstrokes are not unfrequent, and congestion of the liver a very frequent result.

In February, as already stated, we took all ordinary precautions against fever; such as dosing ourselves and people with quinine, keeping fires burning near the tents at night, and making ourselves generally comfortable. Whether there was any necessity for doing all this can scarcely be decided; at any rate none of our party suffered from fever, and the people told us that this was not at all a feverish time.

We were not so fortunate in our next visit, which was made in April. The camp was pitched at the village of Chittoor on the northern end this time, at a height of about 3,000 feet above the sea. We ascended by one of the long valleys on the north-east side of the mountains from the village of Perriaconbay, but descended by the more generally known path which winds gently down the next valley to the north. At this time, I, as well as many of our people, commenced to suffer from a form of jungle fever,\* though we again took precautions against sickness, and did not get rid of it for some months.†

The inhabitants were at that time suffering more or less from fever, nearly all the people showing by their appearance that they are regularly subject to it at certain times. They

\* I had already contracted this form of fever on the Aunamullays during the end of the previous year, but had not had my usual return of it for some weeks.

† This expedition, together with the subsequent camping among the low hills of the Salem District to the east, ended in ourselves and nearly all our people being prostrated with fever and its associated evils (superficial dropsy with some of the men, and a severe form of prurigo with ourselves). For several days we had to rig up a temporary hospital in an empty house or chuttrdm of one of the villages, in which there were seven men sick at one time; while Mr. Foote and myself curiously enough, though providentially, had our fits of fever on alternate days. Some of the men were taken suddenly with fever while waiting at table, and one fine strong man, a lascar of Mr. Foote's, to whose services at table we were finally reduced, actually lay down on the ground in sheer fright and shivered in apparent ague under the impression that he had got the sickness at last. He did get it in the end, and his was one of the severest cases we had in our hospital. Not long after our camp had to be broken up, and the people sent off to different hospitals, or to their own villages to recruit, while we got into Cuddalore as we best could and had to wait there until we were strong enough to move off to the Nilgiris.

said that they were generally troubled with this form of fever during about six months of every year, and that this (April) was the regular feverish season.

It had been raining, according to the general rules, for some time since the end of March, though not very heavily, and this partial wetting of the hills as well as the valleys leading from them, where there is a sufficiently tropical vegetation to give decaying matter, is probably quite a sufficient cause for the prevalence of fever during this time of the year. Whereas, had there been heavy rain, like that of an ordinary monsoon season, it is probable that all miasmatic influences would have been washed away. Indeed, this seems certain, for the healthiest season by all accounts is that which occurs after a good north-east monsoon.

Such apparent physical influences naturally set me trying to find out if the feverishness of the mountains might not be in some way remedied to a certain extent; and it struck me that large reservoirs of water, like the "lake" at Ootacamund, or the smaller one at Yercaud on the Shevaroyes, were at least one of the means which might be adopted for this end, for it seemed to me not unlikely that malaria would be absorbed and carried off by means of large bodies of water which is not stagnant just as well almost as by the heavy rains of a monsoon.

I took into consideration that there is always a good amount of evaporation and condensation going on in mountains, ranging from 2,000 to 5,000 feet, consequent on the changes of temperature which must take place during the 24 hours. Now if we could render the climate more moist during the feverish months (hot months, when plenty of evaporation will go on) there would be a greater tendency to absorption of malaria by the moist air and the carrying of it away by condensation. Such a process can, to a certain extent, be effected by the suggested reservoirs of water, for they would be the suppliers during evaporation, and the receivers of all the little streams and nullahs of water brought about by condensation.

I say, to a certain extent these reservoirs would thus act, because we find that in nature nearly every process is dependent on others; and among other processes working with, and essential to the action of reservoirs of water, would be that of vegetable growth.

Some years ago it was thought by a few medical men of

the Madras Presidency (Dr. Heyne being I think the originator of the idea) that the feverishness of some localities, where no miasmatic influences could be directly accounted for, was due to the character and composition of the rocks constituting the localities. The prevalence of hornblendic and ferruginous rocks with the great amount of magnetism supposed to be generated by them, was then seized upon as a likely cause for the existence of fever at certain times. The rock theory does not hold good, however, for many reasons, principally because we find the same rocks in feverish and healthy localities. In fact, those very rocks mentioned go to make up the greater part of Southern India itself.\*

Irrespective of the subject of fever and its prevention, my attention was drawn to the formation of reservoirs of water by the fact that it is almost impossible to preserve water for any length of time in the tanks of Salem and the low-country around the mountains of that district and the adjacent one of Trichinopoly. This is probably due to the geological structure of the country; around Salem the rocks are very distinctly bedded, partings between being very open, and, as a consequence, the water sinks to great depths.

My friend Mr. W. Fraser, of the P. W. Department, had long before this shown me one of the plans of his scheme for supplying the low-country around the Nilgiris with water by means of these reservoirs; and on seeing the scarcity of water in the Salem country. I immediately looked to the mountains to ascertain if his plan could not be applied here also. To a certain extent, this can be done not only on the mountains, which are under description, but likewise on the Shevaroy's,† only there is the unfortunate drawback that there is not a sufficient water-collecting surface to keep a

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\* A few particular instances were cited of very feverish localities which are just bare masses of dry rock (large bare masses of gneiss, usually the sites of hill-forts) in the neighbourhood of which there is no jungle to speak of. In these localities the most feverish periods appear to be during the hot dry weather or after a slight fall of rain. Here the prevalence of fever is doubtless due to the want of moisture or water sufficient to carry off the malaria hanging about the hills at such times, rather than to the composition of the rocks. The malaria was after all doubtless generated in the adjacent country where much jungle may exist: and it was attracted to and clung around these outstanding bosses of rock: had there only been more evaporation and condensation of moist air in the neighbourhood, it seems to me that the evil would have been absorbed and so carried away.

† The subject of a reservoir on the Shevaroy's has already been incidentally noticed by Dr. Cornish, in his report on the Shevaroy's from data supplied to him by Captain Gahagan, District Engineer.

reservoir always filled on either range large enough to be of any very great use in supplying the tanks of a wide extent of country down below.

However, as I have written, this can be done to a certain extent; and if my ideas regarding the absorption of malaria by large bodies of water be correct, there is thus another incentive to make reservoirs in the mountain basins of southern India.

On the Kolymullays there is only one large stream, but just at the point where it falls over into the gorge opening on to the Toriore valley, a bund might be erected which would collect a large body of water in the wide valley of Coiloorputty. This would, to a certain degree, keep up the supply of the tanks below the eastern side of the mountains, which are at present not at all sufficient in extent or number for the amount of available ground for cultivation. In this way this elevated region might be turned to some additional use. Hitherto it has been one of the great moisture collectors of the country, but observations show that the amount of moisture collected is becoming yearly less and less, principally, no doubt, on account of the reckless clearing of wooded lands. I have suggested one means of restoring this grand attribute, which, in addition to directly benefiting part of the surrounding country, will, along with the regulated preservation of forest to a moderate extent, render these mountains, in all probability, more healthy, and decidedly more useful to the people dwelling on them.

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ART. VIII.—*Annual Report of the Triplicane Dispensary for 1863.* By Native Surgeon MOODEEN SHERIFF.

(Communicated by the Principal Inspector General, Medical Department.)

HAVING nothing more to say than I did in my last Report with regard to my practice among the people and duties in the Dispensary, I beg to select for the present occasion only a few professional subjects, which appear to me of great interest.

1.—*A less painful method of radical cure of hydrocele than the injection of Tincture of Iodine.*

The method now in use by the profession at large is the injection of Tincture of Iodine as originated about 25 years



ago by Mr. Martin, a Medical Officer in the Bengal Presidency, and it is justly held to be the best of all those that have ever been proposed. There are two ways of using the tincture; in one it is diluted in the proportion of 3 i. to 3 iii. of water as originally used and recommended by Mr. Martin; and in the other it is injected in its pure state about 3 i. as an average quantity in an ordinary case of hydrocele.

As far as I am able to find out, the first author that has suggested the use of pure tincture is Professor Syme, and the first Surgeon that has introduced it into practice in India is my immediate superior, Dr. Porteous, who has been using it exclusively for upwards of twenty years. This modification may appear to some of a trifling nature, but I can state without any hesitation that, as regards the success, the injection of pure tincture of iodine bears the same comparison with that of the diluted tincture, as the latter does with the use of all other medicines in hydrocele. It was from Dr. Porteous that I first learnt this method in the year 1858, when I joined the Dispensary, and have since employed it in numerous cases without a single failure. In the existence of so sure a method it is unnecessary, perhaps, to seek for another; it is certainly so for those that practice solely amongst Europeans, who, willingly bear up the pain of operations to get rid of a disease, but it is quite a different case with those that have chiefly to do with natives of this country. The pain produced by injecting the tincture is undoubtedly very great for a short time, this is a great drawback to its use among the natives, particularly in those of the wealthier class, who are generally very timid and cannot be easily persuaded to undergo this operation. Under these circumstances, and while reflecting on some of the pathological peculiarities of serous membranes, it occurred to me a few years ago (1859) that I might be able to induce sufficient inflammation to prevent the secretion of fluid by applying a small quantity of some solid irritating substance to the tunica vaginalis in one or two places, instead of injecting irritating liquids, which necessarily comes in contact with the whole surface of that membrane and thus produces a great pain. How far this idea was realized in practice will be seen from the following brief history of its trials.

A day or two after the above imagination I operated on one of my own private cases as follows. After tapping in

the usual manner and squeezing out the fluid, I dipped the point of a probe in oil and rolled it on some powdered sulphate of copper kept in a piece of paper so as to take up a little of it, then introduced the probe into the tunica vaginalis through the canula and applied the medicine upwards, towards the neck of the sac by rolling the instrument between fingers; the probe being now withdrawn I applied the medicine once more in the same way downwards, towards the bottom of the tumor, and concluded the operation by drawing off the canula. The patient felt a very slight pain in the course of the spermatic cord, and went away to his work after being directed to keep up his scrotum well supported and to come and show himself every second or third day. The quantity of cupri sulphas used was in all about  $\frac{1}{2}$  a grain. The tumor began to swell in the night till it became after four or five days larger than its former size and hard to touch; it was also painful on pressure and when left unsupported, but the patient was quite able to walk about with the use of a tight lungootee or suspensary bandage. The patient was feverish for two days with some pains in the loins. The swelling first began to subside about the 15th day, and gradually and entirely subsided about the end of one month from the date of the operation.

About the same time I applied in another case a grain of sulphate of zinc instead of cupri sulphas, and almost with the same result, but there was one difference between these cases, that is, in the latter the hydrocele was very small and only of a few months' duration.

Last year, in the month of September, I put this method into practice among the out-door patients of the Triplicane Dispensary, and the first case I have operated on, in the presence of any medical officer, was on the 25th of that month. On the morning of that date, a man, named Mahomed Cossim, a servant of his Highness Prince Azeem Jah Bahadoor, whom I was able to get permitted to come and show himself to me any time I like, having applied for relief, I informed Dr. Macfarlane, who was in temporary charge of the Dispensary at that time, of my intention to try the above method on the patient, and he, through his usual disposition, which is justly described by an able medical officer in No. V. of the "*Madras Quarterly Journal of Medical Science*," page 195, honored me with his presence while I tapped and applied cupri sulphas in the manner already

described. The pain was so slight that the man did not complain of it until he was questioned about it, and he went away to his business with a promise to keep the scrotum well supported and to return to the Dispensary occasionally to show himself. After a few days' fever and pain at the commencement, this case has proved quite successful within about 25 days. As Dr. Macfarlane was relieved from the charge of this Dispensary about this time, I have shown the above case to Dr. Porteous. A few days after the above operation, Dr. Porteous having arrived from his journey with His Excellency Governor Denison, now the acting Governor General of India, he ordered me very kindly and encouragingly to admit into hospital as many cases of hydrocele as I could get, in order that he might watch the result of the new operation himself, and he has also kindly examined some of the patients in whom the disease was radically cured. I was not able to get any case of hydrocele to stop in hospital, so, with his permission, operated on many out-door patients. But, as a large portion of these cases never returned to me after the operation to enable me to judge of its result, I consider them too imperfect to be detailed, and shall, therefore, at present, only make a few general remarks.

The number of cases in which the application of solid medicines was tried was 27; in 15 of these cupri sulphas was used, and in all others, calomel, red precipitate, and zinc sulphas were employed; but as the latter medicines more failed than succeeded, they deserve no particular notice. In 15 cases of cupri sulphas I have only seen 9, in 5 of which the cure was quite perfect, in 1 doubtful, and the remaining 3 are still under observation, being lately operated on. With so imperfect a data before me, I cannot come to any decided conclusion as to the merit of the operation, but presume to think it deserves a trial at least under the same circumstances in which it was invented.

The average quantity of sulphate of copper required for the operation is from  $\frac{1}{2}$  to 1 grain, and it should be coarsely powdered, because if it is well powdered, it causes much pain, which is against our object, in adopting this plan of treatment.

## 2.—*A method of radical cure of prolapsus ani.*

First with regard to the bandage. Any one that has any experience in cases of prolapsus ani will admit the great dif-

ficulty experienced in preventing the recurrence of the prolapse with a pad of lint and a T bandage, which is the usual and only method hitherto adopted for that purpose. In some cases, indeed, it is next to an impossibility to prevent protrusion of the rectum with this bandage on account of the strong expulsatory action of the abdominal muscles when the children begin to cry, and what child does not cry when the diseased part is handled? The way I apply a bandage in this disease is as follows. The prolapse being returned, a pad, or rather loose tow, cotton, or rags in pretty large quantity should be well applied to the anus; a four-tailed bandage, which should be from 4 to 6 inches broad and a little more than twice the length of the trunk of the child, is next passed upwards from between the thighs behind and in front of the body and tied on each shoulder. Having thus obtained a fixed point at the shoulders, we can apply any degree of pressure we like to the anus and prevent very effectually the recurrence of the prolapse in spite of the struggling and crying of the little patient. A piece of roller may then be passed around the waist and pinned behind and in front with the former bandage to prevent from moving from side to side, and the child may have its clothes over all.

Secondly, with regard to the use of medicines internally. The after-treatment which I pursue in this disease is also somewhat different from those generally adopted in practice. After clearing out the bowels with castor oil I apply the above bandage, and then bind them with Dovers' powder or Pul. Kino Co. for three or four days, when the bandage is removed and the patient made to remain without it for some hours to allow the bowels to act with or without the use of oil, the bandage is again applied to be followed with astringents as before. A few such repetitions generally effect a permanent cure.

My success with this treatment is very great among the children of natives of this country, and though I do not recollect of having treated any of those of Europeans in this manner, yet I have no doubt that it will prove equally successful if it be tried, and hope therefore that it will not fail to meet with the approval of Medical authorities.

In some of the cases treated in the above manner, I have also tried the application of some medicines to the rectum before it was returned, as recommended by some, and have

found them particularly, if they are of an irritating nature, to be injurious by destroying the mucous membrane and producing irritation with a constant desire to stool, which is, of course, quite necessary to avoid as much as possible to render the plan under consideration successful.

3.—*A very effectual and convenient way of applying pads and slings in cases of fracture of clavicle, acromion process, neck of the scapula, &c.*

The existence of many contrivances and apparatuses for the above fractures, particularly for that of the clavicle, show that its treatment is not quite devoid of skill on the part of the Surgeon. Professor Fergusson remarks, "Fractures of the clavicle will often cause greater trouble than those which are considered of a more serious character and the utmost pains will not, on all occasions, suffice to prevent a slight prominence of the inner fragment. Fortunately, however, this condition is productive of no future inconvenience. In very stout muscular men I have had reason to suppose that a bandage or any other sort of apparatus was productive of no benefit, the weight of the arm and shoulder being such as to baffle all ordinary means of treatment." Any improvement, then, in the treatment of fractures of the clavicle, however slight it may be, deserves a special notice of the profession. I believe I have succeeded in making some improvement in this important point of surgery, as follows.

The most usual method of treating fracture of the clavicle is by the figure of 8 bandage with a pad in the axilla, and a sling to support the arm and raise the shoulder upwards. The use of a pad in the axilla is to act as a fulcrum, and this object cannot be obtained unless the pad is kept constantly and steadily in the axilla; but the turns of the roller over the pads which are generally in use, more or less slip off in a few days, and this necessitates the application of the bandage several times before the fracture is perfectly united. I have lately used with great convenience a pad, or rather an "axillary band" made in the following manner. A triangular piece of cloth about the size and shape of the sling commonly used, being padded with sufficient tow or cotton in its centre and rolled into a band in the same manner as a perineal band; the axillary band is now ready and may be applied to the axilla and tied with both ends over the opposite shoulder.

The sling I use very effectually is made as follows. A piece of roller about one yard and a half in length, with a slit or hole in its centre should go around the elbow and be tied over the neck, the olecranon process of the elbow being fixed in the hole. I call this an "elbow sling" to distinguish it from the common sling in use. Another shorter piece of roller should pass around the forearm near the wrist and be tied also over the neck. By the former we can elevate the shoulder to any extent we like, while the latter supports the forearm. This bandage for the forearm may be dispensed with, if the arm is confined to the side by a few turns of a roller, as it is sometimes, in applying the figure of 8 bandage. Besides raising the arm and shoulder well upwards, which is one of our chief objects in treating the fracture, the handiness, simplicity of application, and saving of cloth are the advantages of the elbow sling. If the patients are stout, the hole for the elbow gives way from the great weight of the arm, in such cases the sling should be double, or the edges of the hole should be turned and stitched all around. The following case may be taken as an illustration of its good result.

In the beginning of last month a young man was admitted as an out-door patient of the Triplicane Dispensary with a fracture of the left clavicle, the result of a forcible fall. There was so much distortion of the broken ends that two of my medical friends who happened to be present when I was applying the bandage in the above manner, remarked that the fracture in this case will never unite without leaving some deformity. However, after its application for the first time, the bandage was never removed until about twenty days afterwards, when the bone was found to have united without the least deformity or irregularity. Dr. Mackay, the Medical Officer who was in temporary charge of this Dispensary about the beginning of the present year, kindly saw the case when I removed the bandage and approved of the principles on which I have adopted the elbow sling and axillary band.

*4.—Occasional occurrence of insolation among the natives of this country.*

Out of the several (30) cases of Coroner's inquest I had to attend last year in the 4th District, there is one in which the death was caused by a disease, which is of frequent occurrence in Europeans in tropical climates, but which I was

not aware of before this (8th December 1863) to occur among the natives of this country, viz., Insolation or sun-stroke, which was well known formerly under the name of Coup-de-soleil.

After its occurrence, however, and while conversing on the subject, I was informed by Dr. Urquhart, the Coroner, and my teacher of Medical Jurisprudence in the Madras Medical College, that there are a few more instances on record in his office, in which the native bricklayers while working in the heat of the sun, were struck down by its effects and died rapidly. But as far as I can inquire, the occurrence of the disease amongst natives is not especially brought under the notice of the profession, I have, therefore, ventured to make some remarks on this case.

Insolation being extremely rare among the natives of India, at least in the Madras Presidency, this case will naturally be looked upon with some doubts as to its real nature, but I shall show the reasons why I consider it to be a case of that disease, and to avoid all exaggerations I shall first give the purport of the evidence of witness, including myself, taken on oath before Dr. Urquhart, as far as my notes and memory enable me.

"1st Witness Veerasawmy, being duly sworn in the Tamil language, deposeth and saith, I am maty in the service of Mr. Dique and live in New Town. I know the deceased, he was a cook in the service of Mr. Vans-Agnew, his name is Venketsawmy, and I have known him for a long time. Yesterday about 10 o'clock in the morning, the deceased and I left home at New Town to go to Mylapoor, we went there, and while returning to near the place where the deceased lies, he fell down suddenly and died after snoring a little. He did not complain to me of feeling ill, nor did he cry out when he fell down; and he had no fit. The deceased was sober, and he had quarrelled with no body yesterday. It was about 2 P.M. when he died."

"2nd Witness, Chinnacooty, being duly sworn in the Tamil language, deposeth and saith, I am the wife of the deceased and lived with him. He left home about 8 yesterday morning, he was then well, but complained in the night before of pain all over his limbs, and in his chest; he had occasional palpitation for the last four or five years. The deceased was a sober man."

"Medical Evidence.—Moodeen Sheriff, Esquire, being

duly sworn, deposeth and saith, I am a Native Surgeon and live in Royapettah. I have examined the body of the deceased, which is that of a man about 50 years of age, stout and muscular, not decomposed, and free from marks of violence. On opening the body, I found the heart quite healthy; lungs much congested posteriorly, the result of post-mortem congestion; stomach quite empty, slightly congested, and had no smell of any liquor; the right kidney and urinary bladder bore marks of ulceration; the left kidney congested; and the liver enlarged and slightly nutmeg-colored.

"All the sinuses of brain were much distended with venous blood, the puncta vasculosa very numerous and large and the substance of the organ was generally healthy, but, rather dull and opaque in its color.

"My opinion is, that the deceased died from the effects of the sun, namely, "sun stroke." A stout and dissipated man might easily have this after walking in the sun as the deceased did."

It is clear from the above evidence that the deceased dropped down suddenly, and after snoring a little died within a few minutes. Now, the causes of sudden deaths are very numerous, but to confine myself only to what is connected with this case and to avoid all that is not to the purpose, I may briefly state that in the absence of all fatal indications in the thoracic and abdominal cavities, as well as in all other parts of the body, the death must be attributed to the morbid condition of the brain, and this was such as would be present after deaths from insolation, apoplexy, and narcotic or alcoholic poisoning; or in other words, from any cause that produces cerebral congestion. But the fact of the man being sober and free from head symptoms within a few minutes before he expired, and from the great rapidity of the death, we may set aside the suspicion of all other diseases, except the first. Besides the exposure of the man for some hours to the vertical sun, which is the most essential condition necessary to produce insolation, which is on that account familiarly known under the names of heat apoplexy and sun-stroke, all other circumstances connected with this case are also more or less consistent with those under which the disease generally occurs, as will be seen from the following paragraph from an article on this subject published in No. II, "Madras Quarterly Journal of



Medical Science," page 323, by one of the Medical Officers who had had much experience during the late unfortunate mutiny of Bengal.

"Insolation has no premonitory stage. Its more prominent symptoms follow each other in quick but regular succession; and its fatal termination, when not the result of secondary complications, is rarely delayed beyond a very few hours.

"Certain conditions of body, such as obesity, or any physical conformation which augments the capillaries, and thereby weakens the vascular system, engenders a proclivity to such attacks.

"The predisposing causes are fatigue, excitement, hunger, thirst, mental or nervous depression, muscular exhaustion, a loss in the balance of the circulation caused by excessive perspiration and frequent diminution or suppression of urine, mechanical obstruction to free respiration, by foreign bodies in the atmosphere, or by extreme rarefaction, long continued deprivation of refreshing sleep, such as occurs in hot weather campaigns and necessitates much night marching, intemperance, injudicious hours for eating and drinking, and errors in clothing."

I shall, however, speak of a few points in the above case separately. It will be observed from my evidence that there was much congestion at the posterior surface of the lungs: they were certainly much congested, but this congestion was solely confined to their posterior surface, therefore, and taking into consideration also the nature of the case, and the length of time the body was allowed to remain before dissection, I believe that it was post-mortem or cadaverous congestion, and had no connection with the pathology of the disease, at least, in this case. By the word nature, I mean the great suddenness of the death, which seems to have much influence in producing cadaverous ecchymosis or congestion in dead bodies. Dr. Taylor, while speaking of the subject, says, "This form of ecchymosis is almost invariably seen on the bodies of those who die suddenly or by a violent death, as well as in individuals who perish from apoplexy, or who are hanged or suffocated." If the suddenness of death, such as in apoplexy, has so much tendency to produce this change in the skin, how great it ought to be in the lungs in cases of heat apoplexy; these organs being very porous and spongy allow the blood after death

to be subjected to the laws of gravitation, not only more than the skin, but also more than all other organs and parts of the body; while heat apoplexy produces death much more suddenly than the common apoplexy.

With regard to the length of time,—the body was dissected about 18 hours after death, and this is I believe long enough to give rise to the change observed in this case in the lungs, particularly in a stout man like the deceased. In numerous examinations of bodies I have made in cases of Coroner's Inquests in the 4th District during the last six years, the post-mortem congestion was well marked in the lungs in all those I have dissected about 15 or 16 hours after death, except in some old, weakly, and emaciated subjects. This congestion is, I believe, more apparent in Europeans than natives, and I well recollect that it was pointed out to me first by the much esteemed Dr. Evans, one of my teachers of the Principles and Practice of Physio in the Madras Medical College, in a few of those bodies that I had dissected in the General Hospital, while a candidate for the Native Surgeonship, and doing duty under him in the years 1857 and 1858.

I attach a great importance to this point, because modern pathologists look upon congestion of the lungs as a most characteristic sign of insolation, and it is highly necessary, therefore, to make this point as clear as possible whenever we get a chance to observe.

The next point requiring explanation is the morbid condition of the liver and urinary organs, which were of too trifling a nature to be connected in any way with the immediate cause of death, but they show that the man was addicted to drinking, and that there must have been some suppression or alteration of the urine, which are included among the predisposing causes of the disease.

Among the many very interesting questions put to me about the case by Dr. Urquhart, there was one with reference to the emptiness of stomach being favorable to the attack of insolation; but being on my oath, and not recollecting at the time any thing about it for certainty, I answered the question very hesitatingly as to its probability, but have subsequently found out in the paragraph already quoted, that thirst and hunger, which are generally the necessary conditions of emptiness of that organ, are also predisposing causes of insolation.

Lastly with regard to the weather. The day the man died, and a day before that, the sun was remarkably hot, having been preceded with a few drizzling and cloudy days.

In conclusion of this Report, I may be allowed to detail two of the many cases of operations performed by Drs. Macfarlane and Porteous during the year.

*CASE I.—Elephantiasis Scroti; entire removal by dissection; recovery.*

Casavah Moodelly, *Æt.* 59, a Malabar man, was admitted into Triplicane hospital 22nd June 1863, with anasarca, depending on Bright's disease. His scrotum was as large as a man's head from elephantiasis, attended with pain and occasional attacks of fever; and he had also a gleety discharge from his urethra. After he was a little better from the dropsy, having expressed a desire to get rid of the enlarged scrotum, Dr. Macfarlane removed the whole growth after the manner recommended by Dr. Montgomery in his very interesting paper, published in No. XII of the "Madras Quarterly Journal of Medical Science," page 345. Dr. Macfarlane was assisted during the operation by Dr. Cornish, myself, and Mr. Boon. The weight of the tumour was more than 3 lb; after its removal the spermatic cords were found to be nearly a foot long, requiring to be doubled two or three times to keep the testicles in their position when the cold dressing with a suspensory bandage was applied. On the next morning when the dressing was removed, the cords were quite contracted and the testicles left in their normal position.

The healing process was rather tardy in this case, the man not being fit to become an out-door patient until the 24th October.

The points requiring notice in this case are, that soon after the operation the urine became bloody, remained so for some days, and then gradually disappeared, even without bearing any trace of albumen on tests. So, the operation not only removed the enlargement of the scrotum, but also the dangerous disease, for which the patient was admitted into hospital. The gleety discharge had also disappeared for some days, but came on again after he was discharged from hospital.

CASE II.—*Scrofulous disease of the shoulder joint; excision of the head and a part of the shaft of the humerus; favorable progress towards recovery.*

Haleem Bee, a small made woman of about 20 years of age, was admitted on the 16th December 1863 with caries of the upper part of the right humerus, probably of scrofulous nature. There were two very large sinuses leading to the joint; one, the largest, situated on the outer side of the arm, a little above the insertion of the deltoid, and the other, at the posterior extremity of the axilla. The bone was felt much diseased through the large sinus, and the pain and discharge were very great.

On the 21st Dr. Porteous made an incision up to the joint from the large sinus, then another across the deltoid anteriorly, and then after dissecting the flaps a little, he found the head of the bone so much diseased and separated from the surrounding soft parts that it was easily removed by fingers. The diseased portion of the shaft was sawn from within outwards with a Butcher's saw belonging to Dr. Montgomery. The flaps were brought together with sutures and a wet roller applied. The arm was supported with a common sling for a few days, and then the elbow sling has been adopted with convenience and advantage. The wound is syringed out through the posterior sinus, every second or third day. The case is progressing very favorably at present, and will likely be cured within a short time.

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ART. IX.—*On the Febrifuge properties of the Thevetia Nerifolia.* By J. SHORTT, M.D., Zillah Surgeon, Chingleput.

(Communicated by the Principal Inspector General, Medical Department.)

THE 5th Volume of the "Madras Quarterly Journal of Medical Science," page 178, contains Dr. Bidie's letter to the Secretary to the Principal Inspector General of the Medical Department, giving an account of the febrifuge qualities possessed by this plant. The tree being familiar to me, I immediately took steps to test its supposed febrifuge qualities.

*Synonyms.*—*Cerbera Thevetia* (Linn.) *C. Peruviana* (Matthews).

*English.*—Exile Yellow Oleander.

*Tamil.*—Tiruvachee.

*Botanical Characters.*—N. O. Apocynaceæ.

*Sexual system.*—Pentandria monogynia.

A tree, 20 to 30 feet in height, with a single, rarely branched, stem. Branching 8, 10, or 12 feet from the soil; *trunk* and branches terete; *bark* greenish-grey, interspersed with white raised spots, the remains of the inter-petiole stipular cilia. *Leaves* linear, slightly tapering at either extremity, opposite, entire, 5 to 6 inches in length, half an inch in breadth, almost veinless, light green above, paler beneath, rather blunt-pointed, slightly grooved at the base on the upper surface; *petiole* sessile. *Peduncles* extra-axillary. *Flowers* yellow, bell-shaped and fragrant. *Calyx* 5-cleft, persistent; segments ovate, lanceolate, acute, three times shorter than tube of corolla. *Corolla* 5-lobed. *Estivation* contorted. *Stamens* 5, filaments distinct, connate. *Pollen* granular, cohering in pairs, and attached by glands at the five angles of the stigma,—a peculiar hour-glass like stigma. *Fruit* a drupe, 1-celled, 1-seeded, comose. Every part of the plant yields a milky, acrid juice.

The tree is common about gardens in Southern India, and is said to have been brought originally from Nepaul under the name of Yellow Oleander. It first attracted my attention in the wilds of Orissa in 1855, where I met with a large solitary tree near a rude Oorya temple in the jungles, and from its situation, it occurred to me at the time that the popular English name of "Exile" seemed very appropriate. I have since seen the tree in the gardens about Calcutta and various parts of Southern India. It is common in the gardens at Madras, and a few trees are to be found growing at this place. The largest trees I have seen were at Palmanair, where they are numerous on Mr. Corbett's farm, and where the fruit also attains a size greater than that of a medium-sized guava, but quite oval: when green, they somewhat resemble a pome, but the sarcocarp cuts like a mango.

The *white milky sap*, which abounds, flows from every part of the tree, and is applied by the natives to boils, which it is said either to resolve or bring to a head rapidly. The *wood* is white and apparently close-grained, very light,

and not of any value. The seed is of an irregular triangular shape, the shell resembling that of the almond in general appearance; the kernel is flat, covered with whitish hairs and contains much oil, which is of a clear, pale-yellow color, slightly viscid and acrid, and is sometimes recommended as a cathartic by the natives, but produces violent vomiting and hypercatharsis. It is seldom expressed for domestic use, but it ought to be profitably turned to account, as the tree fruits freely.

The "Madras Journal of Literature and Science," Old Series xix, No. 41, page 140, contains an account of poisoning from the seeds, which at first seem to have been mistaken for those of the *Jatropha multifida*; but from the specimens submitted by Dr. Balfour of the Bengal Army to Dr. McLagan of Edinburgh, it was readily recognized as the Exile or Yellow Oleander. The following is an extract from Dr. McLagan's communication, detailing an account of two cases of poisoning by this shrub. Dr. Balfour was called by the native doctor to see his own children, reported to be suffering from obstinate vomiting, and narrates as follows:—

"Upon investigation it turned out that they had found the seeds of a shrub called by the natives *Cheen-Ke-Kunēr* or the Chinese Oleander, said to be the *Jatropha multifida* or one of the physic-nuts; they had broken the nuts, and finding the kernels bitter, had played at "Doctors," and had each eaten about one whole nut. (A younger boy said to have eaten half a nut did not suffer at all). This was about noon; at three they ate their dinner in their ordinary style, and were free of complaint; they appeared quite well when I left them to go out to dinner, but soon after began to feel unwell, for they refused their tea. The principal peculiarity in the action of the poison was the style of vomiting, no retching nor straining, but a single gulp without much apparent distress, and then an immediate return to the recumbent posture, and a state of somnolence. The pulse in No. I. was very weak as well as slow, and I was anxious about him for some time. The taste of the kernels is extremely bitter, a persistent aloe flavour, and in this I think it differs from the description given of the physic-nut, which is stated to be sweet like almonds."—*John Balfour*.

"A single glance at the specimens which the letter enclosed, sufficed to shew (that they had nothing to do with

*Jatropha multifida*, but) that they belonged to one of the *Apocynaceæ*, and a short search through the University Herbarium enabled me to identify the plant as *Thevetia Nerifolia*.—*Juss. Ann. Mus.* 346.

"This is a species well known throughout India, more commonly under its older synonym of *Cerbera Thevetia* (Linn). It occurs in almost all the collections from India which are in the University Herbarium."

In Hamilton Buchanan's Catalogue where it forms No. 718, under Willdenow's name of *Cerbera Thevetia*, there is the following account of it :—

"Hab. in hortis Magadha Simillima certe plantæ quæ, ex America alata, in horto botanico prope Calcuttam colitur, et perhibent Brahmani plantam in Scriptis suis antiquis, bene esse cognitam."

On the tally, however, accompanying the specimen there is written,—

"This really was introduced by Dr. Roxburgh, but is called the Yellow Oleander, and supposed to have come from Nepal.—*Patna*, 22nd April, 1812.

"The affirmation made in the catalogue that it resembles a species brought from America, appears to be true ; for, on comparing it with a *Cerbera* from Peru in the University Herbarium, sent as *Cerbera Peruviana* (Matthew's Catalogue 442), I can see no trace of difference between the two plants, and this is the opinion maintained in De Candolle's *Prodromus* where, under *Thevetia nerifolia*, are given not only *Cerbera Thevetia*, but *C. Peruviana* as synonyms.

"O'Shaughnessy states that *Cerbera Thevetia* is said to be powerfully febrifuge, two grains being affirmed to be equal to a common dose of Cinchona.—(*Beng. Dispensatory*, p. 447.)

"Dr. B. subsequently wrote that young M.——, one of the poisoned, who had been subject to ague up to the time of eating the seeds, has had none since. True, the aguish tendency was much weakened, but perhaps the poisoning did him good.

"Almost every Indian plant possessed of bitterness is said, if not in India, at least in books, to be reputed febrifuge : and as to its effects on young M.——, it need hardly be remarked that, a periodical disease especially if on the wane,

might be readily broken up by any agent producing such a commotion in the constitution, as in this case.

"There can be little doubt that, whether febrifuge or not, the *Thevetia* is possessed of very active properties. The symptoms produced at first sight appear to be those of a narcotico-irritant,—the irritant action predominating; but from Dr. Balfour's description, I am inclined to doubt their being narcotic in the true sense, the somnolence, &c., being more like that of exhaustion from a violent acrid substance; the peculiar vomiting was perhaps an action of the stomach itself, unaided by the abdominal muscles and diaphragm. We might well expect the plant to be possessed of dangerous qualities of some sort, considering its affinity with the very acrid *Cerbera manghas* of the East Indies, and the still more deadly *C. Tanghin*, the ordeal poison of Madagascar, of which, if we are to believe it, a kernel not larger than an almond is sufficient to destroy twenty people."

I find that the kernel tastes extremely bitter and produces a slight feeling of numbness and heat in the tongue. It might be administered in medicinal doses.

*Preparation of the Tincture of T. Nerifolia.*—It was prepared by me as recommended by Dr. Bidie. The bark was taken from the trunk of the tree and dried for a few days in the shade, and  $\frac{3}{4}$  i. of it powdered and macerated with  $\frac{3}{4}$  v. of rectified spirits for eight days, and filtered in the usual way.

The tincture so prepared had the deep sherry color, and peculiar odour of the plant, with a bitter taste.

*Physiological effects.*—The acidity of this tincture is well shewn in its effects; when taken in large doses it produces violent vomiting and purging by irritating the gastro-intestinal mucous membrane. One drachm of the tincture in six hours produced violent vomiting and purging, twisting pain in the abdomen, and great exhaustion followed by collapse; producing all the symptoms of cholera, small and imperceptible pulse, cold and clammy skin; thirst, voice reduced to a whisper, sunken eyes, &c.

When given in half-drachm doses, the patients complained of nausea and giddiness, sometimes vomiting and purging, in some less so than in others. The ejections from the stomach were vitiated bile. The stools copious and watery.



Headache, and a tightness in the throat with heat, were complained of by some. Its effects seemed irregular:—in some it produced vomiting, in others diarrhoea, and in others again it acted both on stomach and bowels. In 15 and 20 minim-doses it produced nausea, giddiness, and an uneasy feeling in the stomach in some; whilst in others it seemed to have no appreciable effect.

In 10-minim doses it had no effect, unless repeated every second hour, when it purged or vomited the patient as the case might be. It evidently possesses acrid properties, and when taken in sufficiently large doses, acts violently on the stomach or bowels like all vegetable acrids, greatly prostrating the patient. It requires caution in its use; and in small doses of from 10 to 12 minims, it may be used to check fever, and control the return of the paroxysms. Its effects are uncertain, and therefore require to be watched, and the moment any ill effect is produced on the stomach or bowels, the medicine should be omitted for the day, and, if necessary, it may be repeated the next or following day.

I shall now give three cases in full, in which the medicine was administered.

#### CASE I.

##### FEBRIS INTERMITTENS.

Autenkariem, *Æt.* 20. A stout young man of the Pariah caste, came complaining of fever, from which he states he has suffered for the last two days,—the paroxysm coming on in the evening preceded by rigors.

Pulse full and excited; skin slightly warm; tongue furred; bowels costive.

To have a compound jalap powder now.

*2nd day.*—The medicine acted freely on his bowels, but the fever returned at 3, and left him at 5 P. M. In other respects seems much the same.

R. Tinct. Thevet. Nerifoliæ  $\mathfrak{m}$  x.

Aquæ 3 i. M.

ft. haust. ter in die sumend.

*3rd day.*—The paroxysm of fever returned at the usual hour last evening.

Cont. Haust. Tinct. Thev. Nerifol.

*4th day*.—Fever returned at the usual hour, but the paroxysm was of shorter duration.

R. Tinct. T. Nerifol.  $\mathfrak{m}$  xv.

Aquæ  $\frac{3}{4}$  i. M.

To be taken every 3 hours.

After taking the third dose, he was freely purged five or six times, and complained of great nausea with heat, tightness, and an irritating feeling in the throat. Pulse small and weak ; skin cool. The medicine was omitted, and he had two doses of chalk mixture to check the purging.

*5th day*.—No fever ; is feeling well, but weak.

R. Inf. Chirettæ  $\frac{3}{4}$  ii. ter in die sum.

*9th day*.—Well. Discharged.

## CASE II.

### FEBRIS INTERMITTENS.

Davasagomony Moodelly,  $\text{\AA}$ t. 39, convicted prisoner, No. 383, sentenced to two years' imprisonment.

*21st October*, 1862.—Admitted complaining of the usual symptoms of fever of an intermittent type, stated to have been coming on for the last two days. Was detained yesterday and had an emetic given him, which acted freely. The paroxysm returned at 3 and left at 6 P. M. yesterday.

R. Tinct. Thev. Nerifoliæ  $\mathfrak{m}$  x.

Aquæ  $\frac{3}{4}$  i. M. ft. haust.

To be taken every three hours.

*22nd*.—Fever returned at 2, and continued till 6 last evening. Took four doses of the tincture.

To have 15 minims of this drug for each dose.

*23rd*.—Had some heat of skin at 3 P.M. yesterday. Is now free from it. Bowels regular.

To have the tincture every two hours.

*24th*.—Is free from fever ; complains of headache.

R. Haust. Purgans  $\frac{3}{4}$  iv. stat. sum.

*25th*.—No return of fever.

Nil.

*26th*.—Well. Discharged.

## CASE III.

### FEBRIS INTERMITTENS.

Narrainsawmy,  $\text{\AA}$ t. 31, convicted prisoner, sentenced to six months' imprisonment, two months in jail.

*19th October* 1862.—Admitted complaining of the usual symptoms of fever of an intermittent type.

Was detained under observation yesterday and had an emetic given him which acted freely. Had slight heat of skin last evening; tongue foul; skin warm; pulse excited; bowels costive.

R. Haust. Purgans  $\frac{3}{4}$  iv. now,

Mist. Potass. Nitr.  $\frac{3}{4}$  i.

after the operation of the purgative.

20th.—Fever returned at the usual time. Bowels regular.

Cont. Mist. Potass. Nitr.

21st.—The fever returned at 11 P. M. preceded by rigors, and left at 5 A. M. Bowels open.

Omit. Mist.

R. Tinct. Thev. Nerifol,  $\mathfrak{m}$  x.

Aquæ  $\frac{3}{4}$  i.

ft. haust. To have four doses.

22nd.—Fever returned at 2 this morning, and continued till 6 A. M. Has at present some heat of skin. Took the four doses of the medicine yesterday.

To have xv. minims of the tincture every 4 hours.

23rd.—Fever returned at 2 last evening and continued till 7 P. M. Bowels regular.

Cont. Tinctur.

24th.—Fever returned at 2 and left at 5 A. M., is now quite free from it. Bowels regular.

To take  $\mathfrak{m}$  xx. of the tincture for a dose.

25th.—No fever. Bowels regular.

Cont.

26th.—Well. Discharged.

The last two cases are included in the abstract and forms Nos. 1 and 2.

#### REMARKS.

In case No. I. it will be observed that the patient was rather copiously purged: in the second, the tincture caused headache: and in the third, although the medicine was given in larger doses, the patient complained of no effect whatever.

In the 28 cases, abstracts of which I give below, its effects were much of the same uncertain nature, producing vomiting or purging in some, in others nausea, headache, and tightness in the throat, with other unpleasant symptoms, and in some it produced no visible effect whatever; but in all, it removed the fever completely, for which it was administered.

Table of Cases of Fever treated with *Tinctura Thevetie Nerifolia*.

| No. | Type of fever.         | Number of days under treatment. | Quantity of <i>Tinctura Neri-</i><br><i>foliae</i> taken.                         | Result. | REMARKS.                                                                                                                                |
|-----|------------------------|---------------------------------|-----------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Febris Intermittens... | 8                               | 250 Minims from 10 to 20 Minims doses every 2nd or 3rd hour in an ounce of water. | Cured.  | One emetic day previous, and Haust. Purgans subsequent to admission, Potassæ Nitras Mist. on the 3rd day.<br>(Case given in full.)      |
| 2   | Febris Intermittens... | 5                               | 225 Minims in 10 and 15 Minims doses every 2nd or 3rd hour.                       | Cured.  | Emetic the day previous to admission, and on the 4th day Haust. Purgans $\frac{3}{4}$ iv.<br>(Case given in full.)                      |
| 3   | Febris Intermittens... | 2                               | 75 Minims in 10 and 15 Minims doses every 4 hours.                                | Cured.  | Nihil.                                                                                                                                  |
| 4   | Febris Intermittens... | 2                               | 80 Minims in 10 Minims doses every 4 hours.                                       | Cured.  | Nihil.                                                                                                                                  |
| 5   | Febris Intermittens... | 3                               | 120 Minims in 10 Minims doses every hour.                                         | Cured.  | Nihil.                                                                                                                                  |
| 6   | Febris Intermittens... | 6                               | 120 Minims in 10 Minims doses every 2 hours.                                      | Cured.  | From the 3rd day, when freed of fever, was treated with Calomel, Dover's powder, Ipecac and Infus. Chyretta for an attack of diarrhoea. |
| 7   | Febris Intermittens... | 4                               | 60 Minims in one dose with an ounce of water.                                     | Cured.  | An emetic on admission, on the 3rd day a purgative, and on the 4th day Mist. Pot. Nitras with Tinct. Opii and Soda Sesquicarbonas.      |

Table of Cases of Fever with *Tinctura Theriacæ Nerifoliae*.

| No. | Type of fever.          | Number of days under treatment. | Quantity of <i>Tinctura Nerifoliae</i> taken.            | Result. | REMARKS.                                                                                                                                                                                                                                                    |
|-----|-------------------------|---------------------------------|----------------------------------------------------------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8   | Febris Intermittens.... | 14                              | 390 Minims in 30 Minims doses every hour, 2 doses a day. | Cured.  | Hæst. Purgans on the 4th day of admission, from the 9th day when freed of fever was troubled with an attack of diarrhoea, for which he was given Castor oil, Calomel, Dover's powder and Chalk Mixture.                                                     |
| 9   | Febris Intermittens.... | 19                              | 240 Minims in 30 Minims doses twice a day.               | Cured.  | A purgative. The first 3 days took the Tincture, when it was omitted, and on the 4th day Potassæ Nitras Mixture given instead with Calomel and Pulv. Ant. Co. at bed time, till the 8th day, and from the 9th took Decoct. Cinchonæ with Tinct. Nerifoliae. |
| 10  | Febris Intermittens.... | 4                               | 180 Minims in 30 Minims doses 3 times a day.             | Cured.  | The day previous to admission emetic, and subsequently purgative and Potassæ Nitras Mixture, and on the 3rd and 4th days took the Tinctura Nerifoliae with Mistura Tusei.                                                                                   |
| 11  | Febris Intermittens.... | 5                               | 90 Minims in 30 Minims doses 3 times a day.              | Cured.  | An emetic the day previous to, and purgative subsequent to admission, Potassæ Nitras Mixture for 2 days, and Tinctura Nerifoliae with Mistura Tusei on the 4th and 5th days.                                                                                |
| 12  | Febris Intermittens.... | 6                               | 120 Minims in 30 Minims doses twice a day.               | Cured.  | Hæst. Purgans prior to and emetic subsequent to admission, followed up by Potassæ Nitras Mixture, 3rd and 4th days Tinctura Nerifoliae, and on the 5th and 6th days Potassæ Nitras Mixture was repeated.                                                    |
| 13  | Febris Intermittens.... | 6                               | 240 Minims in 30 Minims doses twice a day.               | Cured.  | Purgative and Potassæ Nitras Mixture on admission only.                                                                                                                                                                                                     |

|    |                         |    |                                                                                              |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----|-------------------------|----|----------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14 | Febris Intermittens.... | 10 | 180 Minims in 30 Minims<br>doses with an ounce of<br>Potass Nitras Mixture 3<br>times a day. | Cured. | An emetic the day previous to, and purgative subsequent to admission, followed by Mistura Potass Nitras, 3rd and 4th days Calomel, Pulvis Antimon Co., and Quinine was given with the mixture, and on the last 4 days took Inf. Chyretta.                                                                                                                                                                                                             |
| 15 | Febris Intermittens.... | 27 | 60 Minims in 30 Minims<br>doses twice a day.                                                 |        | On admission an emetic, took 2 doses of Tinct. Nerifoliae only, 3rd day Mist. Potass Nitras, 4th, 5th and 6th days when freed of fever, was given Inf. Chyretta with Acid Sulph. dil., which was followed by Calomel, Compound Squill Pills and Ext. Conii a few days after he was given Ferri Ammonio Citras. Fever returned again on the 19th day, for which he was given Liquor Arsenicalis with Decoct. Cinchona, and lastly took fish liver oil. |
| 16 | Febris Intermittens.... | 11 | 120 Minims in 30 Minims<br>doses twice a day.                                                | Cured. | Was admitted for dysentery, when well of it, had fever on the 5th day of admission, and was given Tinct. Nerifoliae for the next 2 days, this was substituted by Quinine, Calomel and Pulvis Antimon Co.                                                                                                                                                                                                                                              |
| 17 | Febris Intermittens.... | 4  | 60 Minims in 30 Minims<br>doses 3 times a day.                                               | Cured. | An emetic the day previous to admission, next day purgative and Potass Nitras Mixture was given for 2 days, and on last day took Tinct. Nerifoliae.                                                                                                                                                                                                                                                                                                   |
| 18 | Febris Intermittens.... | 9  | 60 Minims in 20 Minims<br>doses 3 times a day, with<br>Decoct. Cinchona.                     | Cured. | Purgative on admission. Next 2 days Saline Mixture. 4th day Decoctum Cinchona, Calomel and James' powder at bed time, and on the last day Tinctura Nerifoliae.                                                                                                                                                                                                                                                                                        |
| 19 | Febris Intermittens.... | 11 | 140 Minims in 20 Minims<br>doses 3 times a day.                                              | Cured. | Emetic the day previous to, and purgative subsequent to admission. Mist. Potass Nitras 2nd, 3rd, and 4th days. Tinct. Nerifoliae 5th, 6th, and 7th days, and on the 8th, when freed of fever, was given Blue powder and Dover's powder for an attack of diarrhoea, and lastly, Inf. Chyretta.                                                                                                                                                         |
| 20 | Febris Intermittens.... | 12 | 180 Minims in 20 Minims<br>doses 3 times a day.                                              | Cured. | On admission Haust. Purgans 3 iii. after operation, and the next day was given Potass Nitras Mixture, and on the last 7 days Liquor Arsenicalis with Decoct. Cinchona.                                                                                                                                                                                                                                                                                |
| 21 | Febris Intermittens.... | 5  | 105 Minims in 15 Minims<br>doses 3 times a day.                                              | Cured. | An emetic the day previous to admission. Purgative next day, after operation took 2 doses of Saline Mixture.                                                                                                                                                                                                                                                                                                                                          |
| 22 | Febris Intermittens.... | 5  | 195 Minims in 15 Minims<br>doses 3 times a day.                                              | Cured. | Emetic on admission, at night Calomel and Colocynth pills, followed by a purgative next morning.                                                                                                                                                                                                                                                                                                                                                      |

Table of Cases of Fever treated with *Tinctura Thevetie Nerifoliae*.

| No. | Type of fever.           | Number of days under treatment. | Quantity of <i>Tinctura Neri-</i><br><i>foliae</i> taken. | Result. | REMARKS.                                                                                                                                                                 |
|-----|--------------------------|---------------------------------|-----------------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 23  | Febris Intermittens....  | 4                               | 90 Minims in 15 Minim doses 3 times a day.                | Cured.  | Emetic on admission, at night Calomel and Colocynth pills, next morning a purgative.                                                                                     |
| 24  | Febris Intermittens....  | ...                             | 135 Minims in 15 Minim doses 3 times a day.               | Cured.  | Emetic the day previous to admission, next day purgative, after operation Saline Mixture 2 doses.                                                                        |
| 25  | Febris Intermittens. . . | 15                              | 135 Minims in 15 Minim doses 3 times a day.               | Cured.  | Emetic and purgative on admission, the next 2 days Saline Mixture, and on the last 8 days took Cough Mixture, and as a tonic Hydrochloric Acid. dil. with Inf. Chyretta. |
| 26  | Febris Intermittens....  | 4                               | 90 Minims in 15 Minim doses 3 times a day.                | Cured.  | Emetic and purgative on the day of admission, and took 3 doses of Saline Mixture the next day.                                                                           |
| 27  | Febris Intermittens....  | 8                               | 210 Minims in 15 Minim doses 3 times a day.               | Cured.  | Simple Saline Mixture on admission day, and when freed of fever took Dil. Muratic Acid with Inf. Chyretta on the last 3 days.                                            |
| 28  | Febris Intermittens....  | 5                               | 270 Minims in 15 and 20 Minim doses 3 times a day.        | Cured.  | A dose of oil on the day previous to admission.                                                                                                                          |

ART. X.—*Notes on the Arsenical Treatment of Fevers.* By  
HENRY C. BRODRICK, M. D., Assistant Surgeon, 1st  
Central India Horse.

DURING 1863 I commenced the treatment of periodic fevers with large doses of arsenious acid in the manner recommended by Surgeon Major Turner of the Royal Bombay Artillery.

Mr. Turner, who some years ago made this treatment public, was good enough to furnish me with a copy of his paper on the subject, and on several occasions in correspondence most kindly and courteously gave me the results of his large experience in Arsenical treatment.

I have kept notes of 177 cases of periodic fevers I have thus treated during the past year, and proceed now to summarise briefly the results of the practice. Of this number there were—

|                 |     |
|-----------------|-----|
| Quotidians..... | 136 |
| Tertians.....   | 80  |
| Quartans.....   | 8   |
| Remittents..... | 1   |
| Hemicrania..... | 2   |

Total... 177

The cases were mainly treated in the Agency Hospital at Indore, and a few at the Hospital for the sick of European detachments, quartered at that station. The whole of the natives treated and reported upon were out-patients, and comprised Sowars of the Central India Horse, Sipahis of the Bopaul Levy, Burkundazes, Chuprassis, prisoners of the Suddur Jail, domestic servants, and the usual hangers-on of a large bazaar.

They were of all castes and from all parts, from Madras, Calcutta, Bombay, Goa, Agra, Delhi, the Punjab, &c., 160 of the whole were natives and 17 Europeans, Commissioned officers and others, and European soldiers.

Eight of the quotidians were complicated with extensive splenic enlargement and one with constitutional syphilis.

None of the quotidians, tertians nor quartans were distinguished by *much* enlargement of the spleen, and taking this athological change as an expression of the intensity of mala-



rious blood poisoning, it seems that the cases treated were generally of a mild type.

I say *much* enlarged spleen, meaning so appreciable an increase in the volume of the organ as to be obvious at a brief examination. I take it that the spleen is always increased in size in every paroxysm of every periodic fever.

The locality where the cases were treated is about 2,000 feet above the level of the sea, and enjoys a fine healthy climate; the geological features are those so very commonly met with on this plateau, a soil composed of the detritus of basaltic and amygdaloidal traps.

The entire quantity of arsenic taken by the 177 cases amounted to 104 ounces, 7 drachms and 32 minims of the *Liquor Arsenicalis*.

The largest quantity taken by any one case was 2 ounces, 1 drachm and 45 minims. The smallest quantity similarly taken was 12 minims.

On an average each case took 4 drachms and 45 minims during treatment.

The average duration of each case prior to the commencement of specific treatment, was seven and a half days, the greatest duration of any one case prior to treatment was 240 days, a case of quartan fever which was cured with five drachms of the *Liquor Arsenicalis*.

The average duration of the specific treatment, inclusive of days of admission and discharge to duty, was about seven days. The longest time any one case was under treatment was 23 days, the shortest 3 days.

All of the cases yielded to arsenic, to none of them was any quinine given, and very few of the number took emetics or purgatives.

The mode of exhibition of the drug varied of course with the peculiar environments of each case; generally the patient took half a drachm of the *Liquor Arsenicalis* three times a day, and was recommended to abstain from drinking much water for one hour after each dose, and to take food thrice during the day, and his dose immediately after each meal.

Or he took half a drachm or twenty minims every two hours up to four doses, so timed that the fourth dose was taken about one hour before the expected paroxysm.

Early in my experience of this method, I gave arsenic timidly and tentatively, but latterly, I have prescribed it much more boldly, though not in larger quantities than one and a half drachms of Fowler's solution *at once*.

It occasionally produces nausea and vomiting, but these seem invariably to pass off whilst further doses are pushed, and as they passed off so did the fever.

Under ordinary circumstances the patients were discharged cured, after they had escaped two consecutive paroxysms, or rather two epochs of paroxysm.

To be consistent in this mode of treatment, I have taken the remedy myself, and cured myself of a quotidian with 6 half drachm doses of the Liq. Arsenicalis. I may add that although the large doses did not produce vomiting, they made me feel exceedingly sick and miserable.

The results of this specific treatment, are, I think, favorable, but I will not go so far as to say that the cases reported on were cured by arsenic more speedily and satisfactorily, than they would have been by quinine.

They *were* all cured, and in an average of seven days each case counting the days of admission and discharge as two of the seven.

Considering the high price of quinine, and the necessities of public charities, the temptation to the very poor patient to hoard and sell the quinine, if it be given in powder to him to take away with him to his house, and the fact of arsenious acid being procurable in every bazaar, and at a very trifling cost, it follows that arsenic, *if of equal value in the treatment of periodic fevers*, is emphatically the medicine for charitable dispensaries.

It will take some time to drive this idea into the conservative heads of native doctors who would like to treat cases to the end of time with "*di-firitic mixture*" during the paroxysm, and quina in the intermissions, but these functionaries ought to be instructed to keep their quina for old people and young children, for remittents, for scrofulous, ophthalmia, and the like, to economise it, and to treat ordinary cases with the Liquor Arsenicalis.

Whilst they should be taught that emetics and purgatives as a routine preliminary to specific treatment of periodic

fevers, diseases essentially adynamic in type must share the retirement in disgrace of blood-letting from the scene of practice.

I have no corresponding series of cases treated solely by quinine to offer, so that I cannot here test the treatment of fevers by large doses of arsenic by comparison with an equal number of cases treated by the former medicine. Readers, from the pages of their own case books, may contrast the two.

In deciding on the comparative merits of two such noble remedies as quinine and arsenic, it would be necessary to draw up such parallel series of cases; no generalizations are fair, and as I can only supply cases in support of one line of treatment I will say no more in its favor.

Taking the career of one cycle of periodic fever, namely, the paroxysm and the intermission as one whole, we may regard the former as the victory of the poison over the system no longer able to battle against it, the intermission as an armistice during which nature seeks to repair the inroads caused by the paroxysm.

During this time a certain quantity of the poison is eliminated by the skin and kidneys, more doubtfully by the bowels. It is then in the truce that the body must be fortified against the next attack, must be placed in such a state as will enable it to resist the violence of the poison, seeking occasion to explode in a paroxysm. In conducting the above series of cases, I have generally considered that if the patient were guided safely over two of the expected attacks in succession, he might then be counted as having overcome the nervous paresis, having rid himself of a certain measure of the poison, and become superior to the influence of what measure of it might remain.

The question is "*What is the best means of so fortifying the body?*"

All the remedies that are efficacious in the treatment of periodic fevers are tonics, of these the most powerful for good are quinine and arsenious acid, and in considering their relative value, we must bear in mind, besides their intrinsic merits, the measure of their supply, their cheapness, and, in fact, their economical as well as therapeutical aspects.

**ART. XI.—***Brief Notes on the Operations of the Medical Department of the Madras Railway Company.* By W. J. VANSOMEREN, M.D., Consulting Physician of the Company.

OF the many benefits accruing to this country from the institution of Railways, neither the least in number nor the least in magnitude are the means, provided by the several Companies for the skilful treatment of the sick and the maimed among the many thousands of their operatives on the different lines.

2. Long before the completion of these lines, and the establishment of a regular and rapid intercommunication of the different mercantile marts between their extreme points,—when as yet the operations of trade and commerce have scarcely felt the influence of increased and better remunerated labour in the tracts of country, which will ere long be traversed by the Iron horse and its attendant well-laden train, Medicine vindicates her claim as one of the pioneers of progress and civilization,—and, while she blesses the thousands who receive her aid with that health which is indispensable to their toil, blesses also those who employ and dispense her favours with that hearty and effective labour, which only stalwart arms and healthy bodies can accomplish.

3. The provision for medical attendance on the servants of the Madras Railway Company differs on lines under construction, and those which are complete ; and on the former the provision has not always been the same.

4. Originally, during construction, a Dresser or Assistant Apothecary was appointed to the medical charge of every district of twenty-five miles, and an Apothecary to every two districts, covering an extent of fifty miles,—so that in every fifty miles there were three medical attendants. Experience, however, has shewn such provision to be unnecessarily large, and, accordingly, there is now in every alternate district of twenty-five miles an Apothecary and Assistant Apothecary, the former supervising the latter's district, as well as attending to his own. The pay of the Apothecary is Rupees sixty, and that of the Assistant Apothecary Rupees thirty-five *per mensem* ; and either on going into another district on duty, entitles himself to an addition of *batta* at the rate of one rupee *per diem* !

5. On open lines the medical arrangements are different. There are certain stations so large and so important as to require the exclusive attention of one man. Such are the Madras Terminus and Perambore. While others have so few resident employés that the same Apothecary can attend to several stations, and accordingly, from Perambore westward to Beypoor the line is parcelled off among seven Apothecaries. Each, however, has not the same extent of beat to traverse. Coimbatore, for example, has so many resident European drivers and other workmen, that the Apothecary in charge travels only six miles westward to Muddikurry and eastward to an Inspector's house a little west of Somanoor.

6. On the North-west line there is one Apothecary, who resides at Arconum Junction, and travels along the whole open portion of the line to Tripetty in the performance of his medical duties.

7. The salary of these Apothecaries ranges higher than that of those on incomplete lines. The sanctioned pay of the establishment on the South-west line is as follows :—

|                      |            |
|----------------------|------------|
| 1 Apothecary on..... | Rupees 110 |
| 5 Apothecaries ..... | „ 80       |
| 3 Do. ....           | „ 60       |

The only Apothecary on the open part of the North-west line draws Rs. 60 per mensem. All these subordinates furnish regular monthly returns of sick and of the expenditure of medicines, which operate as a salutary check on extravagance and carelessness in the use of the supplies furnished to them.

8. The Abstracts of the Annual Returns attached to these notes shew the number treated under the different classes of diseases every year since 1855, and although every medical man will recognize palpable errors in some of the columns, they may be regarded as fairly representing a large amount of work done by the Apothecaries and Assistant Apothecaries of the establishment.

9. The considerable fluctuations in the numbers, borne on the Returns, depend in great measure on the varying extent of the operations of the Company. When work is carried on briskly in construction, there is of course a large addition to the numbers on the Medical Returns, while these numbers undergo considerable reduction as lines are completed and

opened. During the past year, constructive operations have been at a minimum on the N. W. Line, and the fact is patent in the figures of the returns. When, however, the moot point as to whether the route *vid* Kurnool or Hyderabad to Sholapur is settled, the work will be pushed on with energy, and this will be manifested in a proportionate increment in the Medical Returns.

10. The Annual Return for 1863 is given in full, and not simply in abstract, as for the preceding years. Malarial fevers, diarrhoea, rheumatism, affections of the stomach and bowels, bronchitis, ulcers and contusions occasioned the largest number of admissions on the sick report, and do not call for any further special notice. The occurrence of but one case of *delirium tremens*, however, demands remark. Looking to the large number of European operatives on the Railway to the nature of their occupations, and the particular class from which a majority of them are drafted, one cannot but be surprised that a solitary unit should represent the number of admissions with this disease. That there have been other cases cannot be doubted, and their absence from this return is easily explicable. Men, ailing with the malady in question, prefer seeking medical advice from officers unconnected with the Company, and so far as Madras is concerned, the Register of the General Hospital and note-books of private practitioners most probably contain the names of Railway employes, who were unwilling that *delirium tremens* should appear as their disease in the periodical Medical Returns of the Madras Railway Company. Making every allowance, however, for such cases, it must be acknowledged that there is much less insobriety and its morbid sequela than might be expected among the servants of the Company, especially in a climate which is regarded (rightly or wrongly) as one where the imbibition of stimulants is simply a necessity.

The number of invalids sent home to England from the body of European employes of the Company affords also a very good criterion of their general healthiness or otherwise. I am happy to say that only seventeen have gone home on sick certificate since the first turf was turned in 1853—a fact which speaks well for the salubrity of this climate, as well as for the occupation of the Railway servants, and for their habits of life.

11. In addition to the cases already referred to as seek-

ing and finding treatment elsewhere than in the dispensaries of the Company, and consequently not appearing on its Medical Returns, there are many others who have been treated in the Native Infirmary of Madras and the Dispensary at Salem, to whom there is no reference whatever in the books of the Railway Dispensaries. Some of the most interesting and the gravest Surgical cases I have treated in the Infirmary have been individuals injured on the Railway, and their non-appearance on the Company's Returns is a defect, which should not be allowed in those that are prepared hereafter!

12. Time does not allow me to extract any interesting cases from the records of the Infirmary for several years past, but I may refer to a rare accident, which came under my treatment in May 1863, very shortly after I took charge of the office of Consulting Physician. A clerk, corpulent and heavy bodied, about 45 years of age, on reaching the Madras terminus about 8 P. M. from Arconum, jumped off the engine on which he had been riding, unaware that, in doing so, he was jumping into a pit. He fell on the heel of the left foot which he injured, but was nevertheless able to walk with assistance to the Dispensary about a quarter of a mile off, and from the Dispensary to his home a little less than a furlong distant. The case, strange to say, was reported to me as dislocation of the ankle joint, but on seeing the patient, which I did within an hour of the occurrence of the accident, of course I found the joint untouched, but behind the articulation there was a subcutaneous protruding fragment of bone into which the *tendo Achillis* was inserted above, while below it there existed a perceptible hiatus. It was evident that the tuberosity of the *calcaneum* was broken off and carried upward by the retraction of the tendon inserted into it, and in the feeble hope that,—by keeping the foot extended so as to raise the fractured surface of the *os calcis* towards the tuberosity, and bending the knee so as to relax the muscles of the calf, and permit the tuberosity to descend as low as possible towards the heel bone,—union might be effected, I put up the limb in a double-inclined plane with the foot piece thrown down at a large obtuse angle with that of the leg. Very soon, however, ulceration took place over the protruded portion of bone, which was consequently extracted through a crucial incision, and the position of the fragment showed how hopeless was its union with the body of the bone. The fracture was a vertical one, separating the

whole of the tuberosity from the *calcaneum*, and the action of the muscles of the calf upon the *tendo Achillis* not only dragged the fragment upwards, but also changed its position. What, at the moment of fracture, was the anterior surface, now became the inferior, and the tendon, before attached to the posterior surface of the tuberosity, was now found by the changed direction of that epiphysis, at its superior surface. I need scarcely say that the practical lesson suggested by the case, is immediate removal of the fragment, which I would certainly resort to in a similar one hereafter. The patient made a slow but good recovery, and now walks about with only a slight limp.

14. The families of servants of the Railway Company are also supplied with Medical attendance and medicines. Those in Madras have, however, to pay half cost-price for all drugs furnished to them from the Dispensary in Royapooram.

15. Before concluding these short notes I may state that our operations are not so extensive as to justify our obtaining our medical stores from a wholesale druggist at home. Such an arrangement would demand a regular Store-establishment here, and the expense of this would prove the reverse of economical to the Company, whose periodical indents are at present supplied by one of the Chemists and Druggists at Madras at a liberal discount.





| Classes of Diseases.                | 1857      |           |        |             |       |            | 1858                |          |           |           |        |             |       |            |
|-------------------------------------|-----------|-----------|--------|-------------|-------|------------|---------------------|----------|-----------|-----------|--------|-------------|-------|------------|
|                                     | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. | Numerical Strength. | Average. | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. |
|                                     |           |           |        |             |       |            |                     |          |           |           |        |             |       |            |
| Fevers.....                         | 32        | 2,072     | 2,104  | 2,059       | 11    | 34         |                     |          | 34        | 2,599     | 2,633  | 2,600       | 9     | 28         |
| Diseases of the Lungs.....          | 6         | 183       | 189    | 184         | 1     | 4          |                     |          | 4         | 189       | 198    | 188         | 1     | 4          |
| "    of the Liver.....              | 0         | 51        | 51     | 50          | 0     | 1          |                     |          | 1         | 37        | 38     | 38          | 0     | 0          |
| "    of the Stomach and Bowels..... | 8         | 915       | 923    | 917         | 3     | 3          |                     |          | 3         | 1,416     | 1,419  | 1,412       | 1     | 6          |
| Dropsies.....                       | 1         | 19        | 20     | 19          | 1     | 0          |                     |          | 0         | 22        | 22     | 19          | 3     | 0          |
| Epidemic Cholera.....               | 0         | 333       | 333    | 216         | 117   | 0          |                     |          | 0         | 263       | 283    | 185         | 75    | 3          |
| Diseases of the Brain.....          | 1         | 99        | 100    | 98          | 0     | 2          |                     |          | 2         | 75        | 77     | 75          | 0     | 2          |
| Rheumatic affections.....           | 3         | 131       | 134    | 130         | 0     | 4          |                     |          | 4         | 210       | 214    | 212         | 0     | 2          |
| Venerial affections.....            | 3         | 101       | 104    | 102         | 0     | 2          |                     |          | 2         | 146       | 148    | 144         | 0     | 4          |
| Abscess and Ulcers.....             | 3         | 317       | 320    | 309         | 0     | 11         |                     |          | 11        | 570       | 581    | 572         | 0     | 9          |
| Wounds and Injuries.....            | 14        | 856       | 870    | 856         | 3     | 11         |                     |          | 11        | 1,178     | 1,189  | 1,178       | 1     | 10         |
| Diseases of the Skin.....           | 1         | 80        | 81     | 81          | 0     | 0          |                     |          | 0         | 118       | 118    | 117         | 0     | 1          |
| Other diseases.....                 | 3         | 207       | 210    | 207         | 0     | 3          |                     |          | 3         | 319       | 322    | 313         | 1     | 8          |
|                                     | 75        | 5,364     | 5,439  | 5,228       | 136   | 75         |                     |          | 75        | 7,142     | 7,217  | 7,053       | 87    | 77         |



| Classes of Diseases.             | 1857      |           |        |             |       |            | 1858                |          |           |           |        |             |       |            |
|----------------------------------|-----------|-----------|--------|-------------|-------|------------|---------------------|----------|-----------|-----------|--------|-------------|-------|------------|
|                                  | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. | Numerical Strength. | Average. | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. |
|                                  |           |           |        |             |       |            |                     |          |           |           |        |             |       |            |
| Fevera.....                      | 32        | 2,072     | 2,104  | 2,059       | 11    | 34         |                     |          | 34        | 2,599     | 2,633  | 2,600       | 5     | 28         |
| Diseases of the Lungs.....       | 6         | 183       | 189    | 184         | 1     | 4          |                     |          | 4         | 189       | 198    | 188         | 1     | 4          |
| " of the Liver.....              | 0         | 51        | 51     | 50          | 0     | 1          |                     |          | 1         | 37        | 38     | 38          | 0     | 0          |
| " of the Stomach and Bowels..... | 8         | 915       | 923    | 917         | 3     | 3          |                     |          | 3         | 1,416     | 1,419  | 1,412       | 1     | 6          |
| Dropsies.....                    | 1         | 19        | 20     | 19          | 1     | 0          |                     |          | 0         | 22        | 22     | 19          | 3     | 0          |
| Epidemic Cholera.....            | 0         | 333       | 333    | 216         | 117   | 0          |                     |          | 0         | 263       | 263    | 185         | 75    | 3          |
| Diseases of the Brain.....       | 1         | 99        | 100    | 98          | 0     | 2          |                     |          | 2         | 75        | 77     | 75          | 0     | 2          |
| Rheumatic affections.....        | 3         | 131       | 134    | 130         | 0     | 4          |                     |          | 4         | 210       | 214    | 212         | 0     | 2          |
| Venerial affections.....         | 3         | 101       | 104    | 102         | 0     | 2          |                     |          | 2         | 146       | 148    | 144         | 0     | 4          |
| Abscess and Ulcers.....          | 3         | 317       | 320    | 309         | 0     | 11         |                     |          | 11        | 570       | 581    | 572         | 0     | 9          |
| Wounds and Injuries.....         | 14        | 856       | 870    | 856         | 3     | 11         |                     |          | 11        | 1,178     | 1,189  | 1,178       | 1     | 10         |
| Diseases of the Skin.....        | 1         | 80        | 81     | 81          | 0     | 0          |                     |          | 0         | 118       | 118    | 117         | 0     | 1          |
| Other diseases.....              | 3         | 207       | 210    | 207         | 0     | 3          |                     |          | 3         | 319       | 322    | 313         | 1     | 8          |
|                                  | 75        | 5,364     | 5,439  | 5,228       | 136   | 75         |                     |          | 75        | 7,142     | 7,217  | 7,053       | 87    | 77         |

*Abstract of the Annual Returns.—(Continued.)*

| Classes of Diseases.        | 1859      |           |        |             |       |            | 1860      |           |        |             |       |            |
|-----------------------------|-----------|-----------|--------|-------------|-------|------------|-----------|-----------|--------|-------------|-------|------------|
|                             | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. |
| Fever...                    | 28        | 3,633     | 3,661  | 3,469       | 72    | 127        | 127       | 3,999     | 4,126  | 3,900       | 159   | 67         |
| Diseases of the Lungs...    | 4         | 401       | 405    | 386         | 1     | 18         | 18        | 643       | 661    | 655         | 0     | 6          |
| " of the Liver ...          | 0         | 62        | 62     | 60          | 0     | 2          | 2         | 80        | 82     | 80          | 0     | 2          |
| " of the Stomach and Bowels | 6         | 2,514     | 2,520  | 2,478       | 13    | 29         | 29        | 3,805     | 3,834  | 3,804       | 7     | 23         |
| " of the Brain ...          | 2         | 188       | 190    | 185         | 3     | 2          | 2         | 306       | 308    | 302         | 0     | 6          |
| " of the Skin ...           | 1         | 323       | 324    | 314         | 0     | 10         | 10        | 413       | 423    | 423         | 0     | 0          |
| Dropsies...                 | 0         | 22        | 22     | 17          | 5     | 0          | 0         | 26        | 26     | 24          | 2     | 0          |
| Epidemic Cholera...         | 3         | 195       | 198    | 146         | 50    | 2          | 2         | 561       | 563    | 350         | 210   | 3          |
| Rheumatic affections        | 2         | 321       | 323    | 317         | 0     | 6          | 6         | 480       | 486    | 478         | 0     | 8          |
| Venerial affections         | 4         | 235       | 239    | 227         | 0     | 12         | 12        | 454       | 466    | 454         | 2     | 10         |
| Abscess and Ulcers          | 9         | 577       | 586    | 554         | 0     | 32         | 32        | 1,162     | 1,194  | 1,169       | 0     | 25         |
| Wounds and Injuries         | 10        | 1,114     | 1,124  | 1,071       | 6     | 47         | 47        | 1,601     | 1,648  | 1,614       | 7     | 27         |
| All other diseases          | 8         | 367       | 375    | 349         | 1     | 25         | 25        | 487       | 512    | 506         | 0     | 6          |
|                             | 77        | 9,953     | 10,029 | 9,566       | 151   | 312        | 312       | 14,017    | 14,329 | 13,759      | 387   | 183        |

*Abstract of the Annual Returns.—(Continued.)*

| Classes of Diseases.             | 1861      |           |        |             |       |            |
|----------------------------------|-----------|-----------|--------|-------------|-------|------------|
|                                  | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. |
| Fevers.....                      | 67        | 3,447     | 3,514  | 3,366       | 85    | 63         |
| Diseases of the Lungs.....       | 6         | 542       | 548    | 516         | 3     | 29         |
| " of the Liver.....              | 2         | 31        | 33     | 30          | 1     | 2          |
| " of the Stomach and Bowels..... | 23        | 3,414     | 3,437  | 3,423       | 0     | 14         |
| " of the Brain.....              | 6         | 293       | 299    | 295         | 1     | 3          |
| " of the Skin.....               | 0         | 196       | 196    | 192         | 0     | 4          |
| Dropsies.....                    | 0         | 22        | 22     | 21          | 1     | 0          |
| Epidemic Cholera.....            | 3         | 255       | 258    | 156         | 94    | 8          |
| Rheumatic affections.....        | 8         | 348       | 356    | 345         | 0     | 11         |
| Venerial affections.....         | 10        | 306       | 316    | 304         | 0     | 12         |
| Abscess and Ulcers.....          | 25        | 1,056     | 1,081  | 1,048       | 0     | 33         |
| Wounds and Injuries.....         | 27        | 1,442     | 1,469  | 1,420       | 2     | 47         |
| All other diseases.....          | 6         | 483       | 489    | 483         | 2     | 4          |
|                                  | 183       | 11,835    | 12,018 | 11,599      | 189   | 230        |

| Classes of Diseases.             | 1862      |           |        |             |       |            |
|----------------------------------|-----------|-----------|--------|-------------|-------|------------|
|                                  | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. |
| Febris C. C.....                 | 63        | 2,981     | 3,044  | 2,579       | 0     | 466        |
| Eruptive Fevers.....             | 0         | 141       | 141    | 140         | 0     | 1          |
| Diseases of the Lungs.....       | 29        | 619       | 648    | 630         | 0     | 18         |
| " of the Liver.....              | 2         | 84        | 86     | 84          | 0     | 2          |
| " of the Stomach and Bowels..... | 14        | 3,763     | 3,777  | 3,721       | 10    | 46         |
| " of the Brain.....              | 3         | 285       | 288    | 285         | 1     | 2          |
| Epidemic Cholera.....            | 8         | 186       | 194    | 127         | 66    | 1          |
| Rheumatic affections.....        | 11        | 522       | 533    | 514         | 0     | 19         |
| Venerial affections.....         | 12        | 367       | 379    | 366         | 0     | 13         |
| Abscess and Ulcers.....          | 33        | 1,242     | 1,275  | 1,181       | 0     | 94         |
| Wounds and Injuries.....         | 47        | 1,506     | 1,553  | 1,442       | 6     | 105        |
| Diseases of the Eye.....         | 2         | 376       | 378    | 370         | 0     | 8          |
| " of the Skin.....               | 4         | 247       | 251    | 231         | 0     | 20         |
| All other diseases.....          | 2         | 346       | 348    | 337         | 0     | 11         |
|                                  | 230       | 12,665    | 12,895 | 12,007      | 83    | 805        |

| Classes of Diseases.         | 1863      |           |        |             |       |            |
|------------------------------|-----------|-----------|--------|-------------|-------|------------|
|                              | Remained. | Admitted. | Total. | Discharged. | Died. | Remaining. |
| Zymotic Diseases.....        | 534       | 3,752     | 4,286  | 3,477       | 18    | 791        |
| Constitutional Diseases..... | 2         | 16        | 18     | 9           | 3     | 6          |
| Local Diseases.....          | 161       | 3,897     | 4,058  | 3,672       | 5     | 381        |
| Developmental Diseases.....  | 3         | 16        | 19     | 15          | 0     | 4          |
| Violent Diseases.....        | 105       | 1,112     | 1,217  | 1,032       | 2     | 183        |
|                              | 805       | 8,793     | 9,598  | 8,205       | 28    | 1,365      |



|                          |                           |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|--------------------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Zymotic Diseases.        | Dysentery.....            | 18  | 20  | 19  | 36  | 35  | 33  | 35  | 21  | 18  | 23  | 16  | 15  | 9   | 280 | 293 | 255 | 255 | 38  |
|                          | Diarrhoea.....            | 15  | 50  | 45  | 54  | 50  | 56  | 56  | 25  | 37  | 16  | 33  | 24  | 40  | 486 | 501 | 437 | 437 | 64  |
|                          | Cholera biliosa.....      | 1   | 10  | 28  | 3   | 1   | 2   | 2   | ... | ... | 5   | 24  | 6   | 2   | 81  | 82  | 58  | 58  | 8   |
|                          | Rheumatismus.....         | 17  | 37  | 31  | 45  | 37  | 29  | 23  | 21  | 28  | 14  | 25  | 25  | 14  | 329 | 346 | 312 | 313 | 33  |
|                          | Syphilis Primaria.....    | 2   | 5   | 6   | ... | 3   | 2   | 2   | 3   | 3   | ... | 8   | 3   | ... | 33  | 35  | 33  | 38  | 2   |
|                          | Do. Secundaria.....       | ... | ... | 3   | 2   | ... | ... | ... | 1   | ... | 1   | 2   | ... | ... | 9   | 9   | 9   | 9   | ... |
|                          | Gonorrhoea.....           | 3   | 8   | 9   | 7   | 6   | 5   | 10  | 6   | 5   | ... | 1   | 2   | 4   | 82  | 85  | 85  | 86  | ... |
|                          | Bubo.....                 | 6   | ... | ... | ... | 2   | ... | ... | 4   | 1   | 5   | 2   | 1   | ... | 15  | 21  | 21  | 21  | ... |
|                          | Orchitis.....             | 1   | 4   | 4   | ... | ... | 5   | 4   | ... | 1   | 2   | 2   | 1   | 2   | 27  | 28  | 21  | 21  | 7   |
|                          | Stricture Urethra.....    | ... | ... | ... | ... | 1   | 3   | 1   | 2   | ... | 1   | 5   | 1   | ... | 14  | 14  | 10  | 10  | 4   |
|                          | Purpura.....              | ... | ... | ... | ... | ... | 3   | 4   | ... | ... | ... | ... | ... | ... | 7   | 7   | 7   | 7   | ... |
|                          | Ebrietas.....             | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1   | ... | ... | ... | 1   | 1   | 1   | 1   | ... |
|                          | Porrigio.....             | ... | 1   | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1   | 1   | 1   | 1   | ... |
|                          | Scabies.....              | ... | ... | ... | ... | ... | 23  | 11  | 13  | 2   | 4   | 15  | 10  | 11  | 89  | 89  | 75  | 77  | 12  |
|                          | Draunculus.....           | ... | 2   | 3   | 11  | ... | 6   | 8   | ... | 1   | 1   | 5   | ... | ... | 37  | 37  | 35  | 36  | 1   |
| Constitutional Diseases. | Anasarca.....             | ... | ... | ... | ... | ... | 1   | 1   | ... | ... | ... | ... | ... | 1   | 3   | 3   | 3   | 3   | ... |
|                          | Scrofula.....             | ... | ... | ... | ... | ... | ... | ... | 2   | ... | 1   | ... | 1   | ... | 6   | 6   | ... | ... | ... |
|                          | Phthisis Pulmonalis.....  | ... | ... | ... | ... | ... | 1   | 1   | ... | 1   | 1   | ... | ... | ... | 3   | 5   | 3   | 3   | 3   |
|                          | Hæmoptysis.....           | 2   | ... | ... | ... | ... | 2   | 1   | ... | ... | 1   | ... | ... | ... | 5   | 5   | 3   | 3   | 2   |
|                          | Paralysis.....            | ... | ... | ... | ... | ... | 1   | 1   | ... | ... | ... | ... | ... | ... | 4   | 4   | 3   | 3   | ... |
|                          | Delirium Tremens.....     | ... | ... | ... | ... | ... | ... | 2   | 2   | ... | ... | 2   | 1   | ... | 6   | 6   | 5   | 5   | ... |
|                          | Epilepsia.....            | ... | 1   | ... | ... | ... | 1   | 2   | 1   | ... | 2   | 2   | 2   | 1   | 8   | 8   | 5   | 6   | 3   |
|                          | Hysteria.....             | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2   | ... | ... | ... | 3   | 3   | 2   | 2   | ... |
|                          | Tetanus.....              | ... | ... | ... | ... | ... | 2   | 1   | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
|                          | Cephalæ.....              | 2   | 21  | 27  | 41  | 28  | 18  | 8   | 8   | 9   | 7   | 10  | 5   | 4   | 186 | 188 | 187 | 187 | 1   |
|                          | Neuralgia.....            | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
|                          | Otitis.....               | 5   | 5   | 2   | 3   | 2   | 15  | 10  | 5   | ... | 9   | 7   | 5   | 4   | 15  | 15  | 11  | 11  | 4   |
|                          | Epistaxis.....            | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1   | ... | 6   | 79  | 84  | 72  | 72  | 12  |
|                          | Syncope.....              | ... | ... | ... | ... | ... | 1   | ... | ... | ... | ... | ... | ... | 1   | 1   | 1   | 1   | 1   | ... |
|                          | Bronchitis.....           | 16  | 62  | 36  | 29  | 46  | 24  | 22  | 8   | 10  | 4   | 7   | 10  | 10  | 268 | 284 | 254 | 254 | 30  |
|                          | Pleuritis.....            | ... | ... | 1   | ... | ... | 1   | 1   | 1   | 1   | 1   | ... | ... | 5   | 5   | 5   | 5   | 5   | ... |
|                          | Apoplexia Pulmonalis..... | ... | ... | ... | 3   | 2   | 2   | 1   | ... | ... | ... | ... | ... | ... | 8   | 8   | 5   | 5   | 1   |
|                          | Asthma.....               | ... | 1   | 1   | 6   | 1   | ... | 3   | 2   | 2   | ... | ... | ... | ... | 25  | 25  | 17  | 17  | 8   |



*Annual Return of Sick, Madras Railway Company.*

1863

| Classes.        | Diseases.        | Remained 31st December 1862. | Admitted. |           |        |        |      |       |       |         |            |          |           |           | Total. | Total treated. | Cured. | Transferred. | On Sick Leave. | Total. | Died. | Remaining. |
|-----------------|------------------|------------------------------|-----------|-----------|--------|--------|------|-------|-------|---------|------------|----------|-----------|-----------|--------|----------------|--------|--------------|----------------|--------|-------|------------|
|                 |                  |                              | January.  | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. |        |                |        |              |                |        |       |            |
| Local Diseases. | Gastritis.....   | 3                            | 1         | 2         | 1      | 1      | 1    | ...   | ...   | ...     | ...        | ...      | ...       | ...       | ...    | ...            | ...    | ...          | ...            | 1      | 1     |            |
|                 | Enteritis.....   | ...                          | ...       | ...       | ...    | ...    | ...  | ...   | ...   | ...     | ...        | ...      | ...       | ...       | ...    | ...            | ...    | ...          | ...            | 3      | 1     |            |
|                 | Peritonitis..... | ...                          | ...       | ...       | ...    | 2      | ...  | ...   | ...   | ...     | ...        | ...      | ...       | ...       | ...    | ...            | ...    | ...          | 4              | ...    | ...   |            |
|                 | Ileus.....       | ...                          | ...       | 2         | 2      | 1      | ...  | ...   | ...   | ...     | ...        | ...      | ...       | ...       | ...    | ...            | ...    | ...          | 4              | ...    | ...   |            |
|                 | Obstipatio.....  | 3                            | 118       | 134       | 171    | 157    | 168  | 134   | 109   | 162     | 98         | 151      | 152       | 73        | 1622   | 1625           | 1648   | ...          | 2              | ...    | ...   |            |
|                 | Dyspepsia.....   | 6                            | 26        | 26        | 51     | 35     | 36   | 30    | 25    | 28      | 12         | 16       | 16        | 11        | 807    | 813            | 273    | 1            | 1548           | ...    | ...   |            |
|                 | Colica.....      | 7                            | 24        | 32        | 30     | 21     | 14   | 17    | 17    | 23      | 22         | 30       | 31        | 4         | 265    | 272            | 259    | ...          | 274            | ...    | ...   |            |
|                 | Hæmatemesis..... | ...                          | ...       | ...       | ...    | ...    | ...  | ...   | ...   | ...     | 1          | ...      | ...       | ...       | 1      | 1              | 1      | ...          | ...            | ...    | ...   |            |
|                 | Hæmorrhœis.....  | ...                          | 3         | 1         | 4      | 4      | ...  | ...   | 1     | ...     | ...        | ...      | 1         | ...       | 14     | 14             | 14     | ...          | 14             | ...    | ...   |            |
|                 | Splenitis.....   | ...                          | ...       | 1         | ...    | 3      | ...  | 1     | 8     | ...     | ...        | ...      | ...       | ...       | 12     | 12             | 8      | ...          | 8              | ...    | ...   |            |
|                 | Hepatitis.....   | 2                            | 4         | 1         | 7      | 4      | 8    | 2     | 3     | 4       | ...        | 1        | 2         | 3         | 47     | 49             | 48     | ...          | 49             | ...    | ...   |            |
|                 | Impetigo.....    | ...                          | ...       | ...       | ...    | 1      | ...  | ...   | ...   | ...     | ...        | ...      | ...       | ...       | 2      | 2              | 2      | ...          | 2              | ...    | ...   |            |
|                 | Enuresis.....    | ...                          | ...       | ...       | ...    | ...    | ...  | ...   | ...   | ...     | ...        | ...      | ...       | ...       | 1      | 1              | 1      | ...          | 1              | ...    | ...   |            |
|                 | Hæmaturia.....   | ...                          | ...       | ...       | ...    | 2      | 2    | ...   | ...   | ...     | ...        | ...      | ...       | ...       | 1      | 1              | 1      | ...          | 4              | ...    | ...   |            |
|                 | Orchitis.....    | ...                          | 4         | ...       | ...    | ...    | ...  | ...   | ...   | ...     | ...        | ...      | ...       | ...       | 4      | 4              | 2      | ...          | 4              | ...    | ...   |            |
|                 | Phymosis.....    | 1                            | ...       | ...       | ...    | ...    | ...  | ...   | ...   | ...     | ...        | ...      | ...       | ...       | 8      | 8              | ...    | ...          | 2              | ...    | 6     |            |

|                         |     |                     |     |     |     |     |     |     |     |     |     |     |     |     |      |      |      |     |     |      |    |      |
|-------------------------|-----|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|-----|-----|------|----|------|
| Local Diseases.         | {   | Ostitis.....        | ... | ... | ... | ... | 1   | ... | 1   | 1   | 1   | ... | 4   | 2   | ...  | 2    | 2    |     |     |      |    |      |
|                         |     | Exostosis.....      | ... | ... | ... | 1   | 1   | ... | ... | ... | ... | ... | 8   | 1   | ...  | 1    | 7    |     |     |      |    |      |
|                         |     | Urticaria.....      | ... | ... | ... | 1   | 1   | ... | ... | ... | ... | ... | 4   | 3   | 1    | ...  | ...  |     |     |      |    |      |
|                         |     | Psoriasis.....      | 20  | 21  | 25  | 22  | 23  | 9   | 15  | 9   | 2   | 12  | 5   | 91  | 111  | 86   | 86   | ... |     |      |    |      |
|                         |     | Phlegmon.....       | 12  | 37  | 33  | 48  | 34  | 2   | 4   | 2   | 3   | 2   | ... | 3   | 216  | 228  | 207  | 21  |     |      |    |      |
|                         |     | Paronychia.....     | ... | ... | 3   | ... | 2   | 13  | 15  | 1   | 2   | 2   | 7   | 8   | 1    | 19   | 17   | 2   |     |      |    |      |
|                         |     | Abscessus.....      | ... | ... | ... | ... | 66  | 51  | 37  | 43  | 53  | 43  | 57  | 24  | 1    | 49   | 46   | ... |     |      |    |      |
|                         |     | Ulcus.....          | 82  | 56  | 41  | 57  | 66  | 51  | 37  | 43  | 53  | 43  | 57  | 24  | 26   | 554  | 636  | 100 |     |      |    |      |
|                         |     | Tumores.....        | ... | ... | 2   | ... | 2   | 2   | ... | ... | ... | ... | ... | ... | 4    | 4    | 3    | 1   |     |      |    |      |
|                         |     | Odontalgia.....     | 2   | 7   | 9   | 9   | 10  | ... | 1   | 2   | ... | 2   | ... | ... | ...  | 35   | 37   | 12  |     |      |    |      |
| Developmental Diseases. | {   | Partus Abortus..... | 3   | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8   | 11   | 11   | ...  |     |     |      |    |      |
|                         |     | Atrophia.....       | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1   | 4    | 4    | 3    | ... |     |      |    |      |
|                         |     | Dismenorrhoea.....  | ... | ... | 4   | ... | ... | ... | ... | ... | ... | ... | ... | 1   | 1    | 1    | ...  | ... |     |      |    |      |
|                         |     | Ambustio.....       | 2   | 2   | 1   | 5   | ... | 4   | 2   | 5   | 2   | 2   | 2   | 2   | 27   | 29   | 25   | 4   |     |      |    |      |
|                         |     | Luxatura.....       | 1   | ... | ... | ... | ... | ... | 2   | 2   | ... | 8   | 1   | 5   | 4    | 22   | 23   | 6   |     |      |    |      |
| Violent Diseases.       | {   | Subluxatio.....     | 9   | 5   | 8   | 6   | 12  | 8   | 14  | 12  | ... | 4   | 5   | 6   | 86   | 95   | 83   | ... |     |      |    |      |
|                         |     | Fractura.....       | 1   | 1   | 4   | 2   | 2   | 4   | 3   | 2   | 2   | 4   | 3   | 3   | 1    | 31   | 32   | 26  | 1   |      |    |      |
|                         |     | Contusio.....       | 79  | 50  | 45  | 30  | 35  | 41  | 27  | 35  | 39  | 38  | 32  | 32  | 14   | 418  | 497  | 398 | 99  |      |    |      |
|                         |     | Vulnus Incisum..... | 13  | 48  | 41  | 39  | 65  | 56  | 38  | 48  | 89  | 37  | 43  | 40  | 32   | 526  | 539  | 493 | 45  |      |    |      |
|                         |     | Isolatio.....       | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1    | 1    | ...  | 1   | ... |      |    |      |
| Morsus Serpentes.....   | ... | ...                 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1   | ...  | ...  | ...  |     |     |      |    |      |
| Total.....              |     | 805                 | 846 | 839 | 953 | 953 | 887 | 736 | 611 | 681 | 533 | 711 | 633 | 420 | 8793 | 9598 | 8186 | 16  | 3   | 8205 | 28 | 1365 |

ART. XII.—*Case of Femoral Aneurism, successfully treated by digital compression in the groin.* By J. KENNEDY, Surgeon Major, Garrison Surgeon, Trichinopoly.

MAY 9th 1864.—Samuel Belkfield, Serjeant Major, Garrison Trichinopoly, Æt. 36, an Englishman, resident in India six years, temperament lymphatic, habits temperate, an anemic and delicate looking man, was reported sick in quarters on 7th of this month, and removed to hospital this day. When first visited two days since, he stated that about a week before a small fluctuating and slightly painful swelling appeared at inner side of the lower part of the left thigh, which gradually increased, and thinking that it was of a phlegmonous nature, he painted it with Tincture of Iodine, which has reddened and slightly abraded the integument. The tumour is distinctly an aneurism of the femoral artery, being of the dimension of a large sized billiard ball, and situated at the upper part of the inferior third of the thigh, where the artery is about to turn to the posterior aspect of the thigh. There is strong pulsation in the tumour synchronous with the arterial pulsation, and by compressing the artery in the groin the tumour becomes flattened and ceases to pulsate, and on removing the pressure the swelling and pulsation at once return. Treatment by compression having been previously decided on, the same was tried whilst he was in his own quarters, but not effectively from want of proper apparatus and assistance; he is accordingly removed to hospital, and as there is no special apparatus for compressing the artery procurable, six European orderlies have been detailed for that purpose, and have been instructed to effect by means of the thumb constant compression of the artery in the groin, relieving each other in turn.

10th.—Found that compression of the artery from some unexplained cause had not been continuously kept up during the night, the aneurismal tumour is consequently much in the same state as noted yesterday. Strict orders issued to see that the orderlies (who are to be relieved at regular intervals) compress the artery as previously directed. Chicken diet.

Vespere.—Pressure kept up steadily since morning; aneurismal swelling less prominent; pulsation slightly decreased;

some uneasiness from the pressure in the groin ; compression to be continued.

R. Tinct. Hyoscyami  $\mathfrak{m}$  40.

Spts. *Æther Nitrici* 3ss.

Mist. Camphor 3i.

Mft. Haust to be taken at 8 P. M. and at midnight.

11th.—Compression has been constantly applied. Tumour decidedly smaller, being considerably flattened and circumscribed, force of pulsation diminished ; slept at intervals, and does not complain much of the pressure ; compression continued.

*Vespere.*—No material change ; continue the compression ; repeat anodyne draught at 8 P. M. and midnight.

12th.—Slight diminution of tumour ; pulsation of same force as yesterday—continue the treatment.

13th.—The tumour has materially decreased, it is harder, more circumscribed, and when the artery is left uncompressed the pulsation is observed to be lessened in force ; compression continued ; anodyne draughts to be repeated as before ; 1 pint beer.

14th.—Tumour smaller and harder ; less pulsation ; complaining of the pressure ; treatment continued.

15th.—Slept pretty well ; tumour continues to lessen ; solidification slowly taking place ; pulsation much decreased ; treatment continued.

16th.—Complaining much of the pressure in the groin, which has been, in consequence, shifted to a spot about an inch lower. Tumour of same size, but more solid ; pulsation is now very feeble ; continue the treatment.

17th.—No pulsation whatever in the tumour, which is somewhat larger, entirely solidified, and hard to the touch. It is stated that the pulsation ceased about midnight ; has complained much of the pressure in the lower part of the groin, and he is irritable and restless ; compression to be changed to site first selected higher in the groin, and to be continued in a slighter degree 40 hours longer.

Repeat anodyne draughts.

18th.—No pulsation in tumour, which has become somewhat smaller and softer ; continue compression and repeat the anodyne draughts.

19th.—Tumour softer ; no pulsation ; compression discontinued at midnight, and has not been resumed. Patient directed to remain quiet in bed ; no compression ; full diet.

20th.—Tumour continues to lessen ; no pulsation. Nil.

21st.—Tumour less prominent. Nil.

22nd.—No material change. Nil.

24th.—Tumour slightly decreased—no pulsation. Looks pale and weak, and he is evidently suffering from the intense heat of the weather.

R. Ferri et Quinæ Citrat. grs. iii.

Tinct. Zingiber 3ss.

Aquæ Cinnamoni ʒ i.

M ft. Haust bis die sumend.

28th.—General health has improved since the last four days. The tumour is less prominent, but on a minute examination, whilst the muscles are relaxed, it is found to be of nearly the size noted on his admission into hospital. No pulsation detected, and there has been since the 17th instant distinct occlusion of the artery ; no pain or uneasiness experienced. Has been permitted to sit in a chair with the limb elevated and supported ; continue haust.

June 1st.—Tumour very slowly decreasing ; no uneasiness ; general health materially improved ; continue medicine.

5th.—Tumour decreasing, it is firm, and entirely free from pain even on pressure, allowed to walk about the ward. Continue medicine.

12th.—The tumour has materially diminished ; no uneasiness ; continue medicine.

14th.—Tumour now about half its original size ; patient moves about without any uneasiness. Discharged from hospital and permitted to reside in quarters during convalescence ; omit medicine.

The foregoing case of femoral aneurism of a large size treated by digital compression speaks for itself. Want of proper apparatus (the common screw tourniquet having been tried and found unsuited) necessitated the employment of the mode of compression above noted, which, though neither perfectly constant, nor very accurately regulated, had the desired effect, viz, the gradual deposition of fibrine in the aneurismal sac and artery, and complete occlusion of the artery on the 7th day.

ART. XIII.—*A Sketch of the Sanitary Condition of the Pootoor lines at Trichinopoly.* By W. H. MORGAN, Assistant Surgeon, 23rd Light Infantry.

IF we hold with Locke that "the pictures drawn in our minds are laid in fading colours, and if not sometimes refreshed vanish and disappear," hardly any apology would be required for the following sketch. Access to written reports, and to the ancient history of Cantonments, is difficult to men interested in their study ; and it is presumed that the Medical Officers of regiments might, by publishing their observations on particular Cantonments, or on parts of them, to some extent facilitate the work of the Sanitary Commission ere their stations are visited, and their hygienic arrangements scrutinized.

From the constant changes of officials it often happens that what to-day is an admitted and recognized fact regarding the salubrity or insalubrity of a particular locality, may a year hence be disputed : an unrecorded but frequently expressed impression may be plain to those who have heard the latter, but a new comer would naturally be disposed to satisfy himself by personal experience and observation before committing himself to an opinion. In this way old ground is travelled over, and evils remain unremedied while information is being acquired.

The Pootoor lines at Trichinopoly are occupied by one of the regiments of the Madras Army, and year after year they have been subject to outbreaks of cholera. While lamenting with the world at large that the precise cause of cholera has escaped detection, it may not be unprofitable to examine whether the lines in question are not from their situation, water-supply, ventilation and other sanitary conditions, obnoxious to this disease.

This part of Trichinopoly is bounded on two of its sides by the Wyacondaun channel and an off-shoot from it ; and on the remaining are the parade ground and a native bazaar. The channel just named flows N. E. from the Cauvery, and its banks are used by the natives as a place d'aisance, so that at Pootoor its waters are impregnated with organic impurity of the worst description. At the Pootoor bridge, as if to render the water more deleterious, the channel is patronised by bathers of both sexes, and numbers of horses and

cattle are led to it for purposes of draught and ablution. Occasionally a host of carts and other vehicles begrimed with the dust and dirt of the Cantonment is washed therein, and the Wyacondaun rolls its slow length along parallel to the lines towards the Fort where I shall leave it.

At right angles to the channel just noticed there is a smaller one running immediately behind the lines, and this more than the other, because better sheltered from observation, is devoted to the worship of Cloacina. Both the water courses are pleasant to look at when flooded from the Cauvery, but as the water is drawn away into adjacent fields, there is in lieu of the murmuring stream a series of pools and puddles with sufficient moisture for the neighbouring butcher to wash his trays in, and for an itinerant vegetable seller to dip his greens in before offering them to the public. The records of the Session Court in the vicinity can testify to the occasional presence of a murdered infant in the stream—while none of course is available regarding the carcasses of dogs and cats that flow by.

The next boundary to be disposed of, is the bazaar in the rear of the lines. The so-called regimental bazaar is under the control and surveillance of a Kotwal who is under the orders of the regimental authorities. There is little to object to it, and the adjoining market in outward appearance, excepting that both are perhaps too crowded. From the dilapidated condition of some walls in the latter one obtains an insight into compounds swelling with dirt and ash heaps which have accumulated for years, and which have rarely, if ever, been touched. From the total absence of drainage, I conclude that refuse water is allowed to soak into the soil, while rubbish is, from time to time, added to the accumulations above mentioned. From the innate propensity of natives to keep their dwellings closed, it may be inferred that very little light enters into them. Lime washing is rare, and to compensate for this a solution of cow dung is sprinkled on the floors, and on the walls for aught that is known to the contrary.

Extending beyond these limits there is an extensive area of rice cultivation which, in the words of Dr. Norman Chevers,\* "is another word for swamp or place in which all malarious venoms—ague, dysentery, asthma, cholera,—breed eternally until thorough drainage breaks up their nests." I

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\* See "Indian Annals of Medical Science," No. xvii., p. 62.

am aware that other parts of Trichinopoly may be pointed out where the risk to health from the neighbourhood of rice cultivation is not marked; but the space at my disposal prevents me from entering into the question. Few medical men will dispute that the continued operation of the sun's heat on moisture stagnant at or near the surface of the ground plays an important part in the generation of malaria, and that such is the normal condition of rice fields will not be denied.

On a side of the road leading to what is known as the doby's quarter, there are a number of hollows which in some measure serve as receptacles for filth, and the nuisance would be greater were it not that some of the European officers live in the neighbourhood. After rain, water stagnates in these pits, and eventually disappears by evaporation, and percolation into the soil. There is a large tank to the north of the hospital, the water of which is used for washing and drinking purposes, but much cannot be said in favor of the complex operations there practised. Another tank appears during the wet weather in a direction opposite to the one last mentioned, into which some of the refuse from the lines flows. On the borders of the tank are heaps of dirt and ashes which a few smart showers would wash into it. The huts have been limewashed recently at the public expense, and look clean and tidy externally. There are about sixteen rows of them running at right angles to the main road and parallel to each other; about ten more are separated from those mentioned by a thoroughfare. There are from 18 to 24 huts in each row. The space allowed by regulation is as follows. Subadars 30 ft.  $\times$  40; Jemadars 30  $\times$  30; Havildars 30  $\times$  20; Drummer, Bugler, Naigue 30  $\times$  16; Private 30  $\times$  12. If the hut covered the whole of the space assigned, one might conclude that the sepoy was liberally supplied with air.

The interior economy of huts probably varies. One I saw last year had a hollow at one angle of the enclosure in which ashes and sweepings were deposited, and another part screened was used as a necessary, as I understood, by the females of the family. A court about 16 feet long intervened between the street wall and the hut proper a tiled room about 12  $\times$  12  $\times$  12. In some huts the room is divided by a slender partition, and it is in these that the family cook, eat, sleep and spend their time. The court is some-



times used for cooking and bathing purposes. I have seen a woman lying ill with cholera in one of these hovels, and a chatty of rice boiling not two feet from her; and have further noticed a native officer leading a pony into his enclosure. It is not uncommon for a pukkally, I have been told, to share his frail tenement with his bullock and water bags. Assuming 12 ft.  $\times$  12 ft.  $\times$  12 ft. as the dimensions of an ordinary hut, it would be necessary to divide the product obtained by the multiplication of these figures by 2, 3, 4, 5, or 6, to understand how many cubic feet of air are available for the inmates. A forlorn sepoy, a man without wife and children or relations of some sort to share his all is rarely met with.\* The practice of sleeping out in the open air does not prevail to any extent in this locality. There are no windows except in the quarter occupied by the buglers and musicians. As the refuse water from these dwellings is not, as a rule, seen behind or in front of them (except near those of the native officers) it must be concluded that it is allowed to trickle into the soil. The passage between the backs of the rows of huts is *sometimes* resorted to for purposes of nature: and though at an inspection specially ordered for the purpose signs of it may be absent, yet from continued observation I may state that such is the fact. The General Regulations direct that the street in front of the huts should be 25 feet in breadth, and it would be as well if the passage at the back was made as broad. It would be then used as a thoroughfare, and perhaps obviate difficulties to those sepoys who are occasionally seen rooting up grass, collecting pebbles, or it may be "picking up shells" in these sheltered nooks.

The filthy habits of natives are so well known that they need not be sketched afresh for the latitude of Pootoor. Let the subjoined extract from Mr. Cornish's Mortuary Report for 1861 suffice. "The real evil of overcrowding seems to be in the concentration of human filth, which cannot accumulate beyond a certain limit without producing epidemic disease. Wherever natives congregate, whether it be in military camps, at famous shrines for

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\* At page 153 of the valuable "Report of Commissioners appointed to inquire into the Sanitary state of the Army in India," I find it stated that sepoys' huts cost about two rupees. It may be so in more favored parts of India, but the price of those at Pootoor is between Rs. 16 and 20, which the sepoy like another class of unfortunates has to pay for himself, pay for with great difficulty and at the cost of many sacrifices,

pilgrims, in crowded towns, or in the huddled together mudhuts of isolated villages, the atmosphere and soil are sure to receive a foecal taint and to become foci for epidemic diseases, and more especially cholera. The evil is increasing year by year, and must continue to increase so long as the present imperfect arrangements for the carting away of night soil from populous districts are in force. It is not too much to say that cholera is almost, if not entirely, kept up by the filthy habits of the native population who, whenever they have the opportunity, use the road-sides and hedge-rows and waste places as open necessaries. There is scarcely a village or hamlet in the country the air of which is not vitiated by the emanations resulting from this abominable practice. The system is so deeply rooted amongst the people that nothing but the strong arm of the law can be brought to bear upon it, with the view of mitigating the evil and diminishing the sources of cholera."

Numerous other authorities might be cited to show the intimate connection between dirt and disease, but I shall trespass upon the patience of my readers with a short passage from Dr. Hathaway's report upon the Conservancy arrangements in the Punjaub\*—"The intimate connection between dirt and disease, which is proved by the most unmistakable evidence to exist in all countries and climates, is perhaps still more apparent in India, where, under the continuous powerful influence of a tropical sun, with a long and protracted rainy season, followed by a very brief and mild period of cold weather that is not severe enough to receive the name of winter, the results of neglecting the hygienic laws of nature are daily witnessed in the numerous forms of disease which run their course with the most rapid and fatal effect."

The construction of latrines in the native lines at Trichinopoly has been, I believe, decided on, and if the natives would use them, a great difficulty would be overcome. But might it not be doubted whether, the veiled beauties or hags (there is no saying which) who are so jealously guarded would be permitted to resort to public conveniences of this description. Is the strong arm of the law prepared to interfere with a caste prejudice? An efficient staff of toties would be required to prevent the proposed latrines

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\* Madras Quarterly Journal, Vol. vi., p. 223.

from proving a greater nuisance than the one they are meant to displace. In Pootoor we are cramped for room. If the eligible sites are used, one latrine would be placed in front of the Sessions Court, and it may be doubted whether a building sixty feet long, even if it had an ornamental front with "*Salus populi suprema lex*" by way of apology, would not call forth an indignant protest against it from the presiding judge. The other site would be objectionable, as the effluvia from it would be wafted in the direction of the parade ground and officers' quarters.

Most of the sepoy are rice eaters, very few abstain from animal food, some are partial to fermented liquors, and nearly all use nervine stimulants. The majority give one the impression of being under-fed, and the late increase in the sepoys' pay was long required. Last year we saw a poor man, who was labouring under an abscess, to whom good nourishing food was life, prefer parched rice and jaggery to the hospital comforts at his disposal. Convalescents from cholera were better pleased when they were permitted to return to pepper water or rice congee in lieu of the broths, soups, jellies and wine I was enabled, through the liberality of the European Officers, to procure for them.

Drinking water is obtained from the Wyacondaun channel, from wells scattered through the lines, and from one of the tanks mentioned before. They all contain organic matter and lime, and enough has been said to show that the purity of the principal source (the Wyacondaun channel) is questionable. A careful analysis of the drinking water of this and other Cantonments is still a desideratum. However much a medical man at an out-station may desire to give his attention to this subject, he finds obstacles which prevent him from accomplishing his object.

The dress of the sepoy is so well known that it may be very briefly disposed of. The legitimate inference from the use of cotton clothing at nearly all seasons by all classes of natives, and from the habitual dress of the sepoy when off duty, is, that the regulation clothing is for many months warmer than necessary. Whether the Madras army is ever to be attired in the Zouave fashion, as I believe some regiments in Bengal are, is still uncertain, but the tendency of medical opinion is in its favor.

The regimental hospital is about 130 yards from the last range of huts. It served as a traveller's bungalow in times

past, but a salubrious locality having been found for the latter, the transition of the old one into an hospital followed not long after. To its right is an old grave yard with tombs and tomb-stones standing out in bold relief, so that the eyes of the cholera-stricken on their way for treatment cannot avoid resting on them. By the tumbling in of a wall, convalescents on the hospital verandah are afforded a fair view of the interior of the grave-yard. Immediately behind lives the principal undertaker of Trichinopoly ; and as if to discompose the gravity of the neighbourhood there is or was a brothel on the opposite side of the road. In a line with the last are houses or huts in every variety, with compounds clean or dirty according to the tendencies of their occupants. The hospital wards are capable of holding 18 patients with an area of 1,000 cubic feet per patient ; to receive this number the beds are placed about  $3\frac{1}{2}$  feet from each other. This accommodation is insufficient during the prevalence of cholera, as each patient has an orderly comrade or two to administer to his wants, and the wards are pretty full with patients, orderlies and anxious relatives. The verandahs are not available for the sick, two of them have no communication with the wards and are used by the patients at meal times, and of those remaining the one in front is occupied by the hospital guard, while the one behind serves as a common passage to the privy and bath room. There is a closet at each end of the building ; one serves as a store room, a second capable of receiving one cot is reserved for moribund cases and sometimes serves as a dead-house ; a third answers for any case of contagious disease ; and the last is used as a bath room. I am told that in bye-gone days the regimental hospital stood on the north face of the parade ground, and in all Pootoor there could not have been a better site chosen for this purpose. Indeed a stranger on his first survey of the neighbourhood would be disposed to say—this is a guard room I know from the sentry in front of it : the building next it from its size I take to be the regimental place of arms ; the next from the little urchins at play must be the regimental school ; and the one beyond it from its air of quiet and comfort I conclude is the regimental hospital. Upon enquiry he would find himself right in his surmises of all but the last, which shelters logs of timber and other building materials (all useful in their way) ; while the hospital would be found in the vicinity of the grave yard above mentioned. There are no

doubt others who think that the regimental hospital ought to be where the office of the District Engineer now is, but having heard him say so, I may state that this was certainly the opinion of Major-General Coffin, who up to a very recent period commanded the Southern Division.

An account of the sanitary condition of any station would be incomplete without statistics; and though those at my disposal (which have been kindly furnished by the Medical Officers to whom I applied) are wanting in uniformity, they favor the opinion of the insalubrity of Pootoor. Mr. Fry, of the 21st Regiment N. I., finds by the Historical Register of that corps that the regiment was quartered for two years and seven months (1857-59) in Pootoor, and that much of the sickness was attributed to the men living in the bazaar, there being no lines at the time, and to the scarcity of provisions. In 1857-58 there were 716 cases of all diseases admitted, and 745 in 1858-59. The following detailed statement of the admissions and deaths from Cholera, Fever, Diarrhoea, and Dysentery, has also been furnished by that gentleman.

*21st Regiment Native Infantry.*

|                    | Cholera. | Fever. | Eruptive Fevers. | Diarrhoea. | Dysentery. | Strength.                   |
|--------------------|----------|--------|------------------|------------|------------|-----------------------------|
| 1857-58. Admitted. | 12       | 143    | 6                | 25         | 14         | During these years was 838. |
| Do. Died.....      | 3        | 0      | 1                | 2          | 1          |                             |
| 1858-59. Admitted. | 23       | 215    | 8                | 42         | 15         |                             |
| Do. Died.....      | 12       | 2      | 0                | 0          | 0          |                             |

From Mr. Dempster I learn that the 39th Regiment at Pootoor, during the years 1861 and 1862, had 48 admissions from cholera, of which 28 proved fatal out of an average strength of 665. There were besides 30 cases among the camp followers, of which 19 died. My friend appends a table of the admissions and deaths from all causes, exclusive of cholera, for the years above mentioned.

39th Regiment Native Infantry.

|                       | Admissions. | Deaths. |                       |
|-----------------------|-------------|---------|-----------------------|
| Zymotic diseases..... | 434         | 4       | Exclusive of Cholera. |
| Constitutional do.... | 2           | 1       |                       |
| Local do....          | 186         | 2       |                       |
| Developmental do....  | 20          | 1       |                       |
| Accidents.....        | 40          | 0       |                       |

The next table has been framed from the records of the 13th and 15th N. I., both quartered at Trichinopoly since 1860 at the south end of the Cantonment. Figures from the books of the 23rd are given for 1862 and 1863.

| Year.     | Regiment. | Strength.         | Average daily sick. | Total sick. | Deaths from all causes. | Admissions from Cholera. | Deaths from Cholera. |
|-----------|-----------|-------------------|---------------------|-------------|-------------------------|--------------------------|----------------------|
| 1860..... | xiii.     | 703 $\frac{1}{2}$ | 11 $\frac{2}{3}$    | 334         | 19                      | 19                       | 11                   |
|           | xv.       | 594               | 17 $\frac{1}{2}$    | 306         | 15                      | 10                       | 9                    |
| 1861..... | xiii.     | 660               | 10                  | 245         | 4                       | 7                        | 3                    |
|           | xv.       | 623               | 13                  | 415         | 3                       | 7                        | 2                    |
| 1862..... | xiii.     | 642               | 5 $\frac{1}{2}$     | 184         | 9                       | 6                        | 2                    |
|           | xv.       | 676               | 9 $\frac{1}{2}$     | 369         | 6                       | 6                        | 2                    |
|           | xxiii.    | 686               | 12 $\frac{1}{2}$    | 385         | 11                      | 25                       | 9                    |
| 1863..... | xiii.     | 715               | 8 $\frac{1}{2}$     | 171         | 8                       | 10                       | 6                    |
|           | xv.       | 727               | 10 $\frac{1}{2}$    | 253         | 3                       | 7                        | 1                    |
|           | xxiii.    | 680               | 13                  | 428         | 27                      | 34                       | 22                   |

The contrast between the different regiments in Trichinopoly in the number of admissions and deaths from Zymotic diseases is shewn below.

|           | 13th N. I. |       | 15th N. I. |       | 23rd L. I. |       |
|-----------|------------|-------|------------|-------|------------|-------|
|           | Admitted.  | Died. | Admitted.  | Died. | Admitted.  | Died. |
| 1862..... | 116        | 6     | 246        | 3     | 271        | 9     |
| 1863..... | 76         | 5     | 174        | 2     | 285        | 22    |

An examination of these figures will show :—that more than half the regiment quartered at Pootoor has passed through hospital every year.—That some are annually liable to cholera, and that these are in excess of the admissions from the same disease into the hospitals of the two other native regiments in Trichinopoly.—Further that the *deaths* from cholera alone in the 23rd Regiment have exceeded the *admissions* from the same diseases into the 13th and 15th hospitals during the last two years. And I might add that there have been other deaths in the lines which have been from time to time reported to the regimental authorities. Mr. Dempster, as just seen, notices the death of 19 camp followers out of 30 that were attacked. The Adjutant of the 23rd Regiment estimates the deaths of followers at 70 in 1862, and for 1863 he gives 71 as the number attacked and 17 as the number of deaths. Whether all these were deaths from cholera might be open to question, but from whatever cause they arose, do they not bear valuable collateral testimony to the insalubrity of these lines?

It is no poetical fiction to assert that if cholera does appear again in Trichinopoly (as probably it will in November or December next) that it will seek the Pootoor lines with "an instinct as unerring as that which leads the swallow summer after summer to the nest in which it was nurtured." In change of place lies the best chance of escape from this formidable enemy. "We know," says an experienced observer\* "that there is a poison around almost as deadly as the bite of a snake and far less amenable to treatment ; experience teaches that by CHANGE OF PLACE we may escape from it."

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ART. XIV.—*Government Pharmacy in India.* By EDWARD NICHOLSON, F. C. S., Staff Assistant Surgeon, Cannanore.

It is undeniable that, of late years, the acquaintance of the British medical profession with the remedies they employ has decreased in proportion to the growing separation of the practice of medicine and of pharmacy. Not that the separation of the doctor's consulting room from the druggist's

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\* Dr. Kenneth Mackinnon, late of the Bengal Medical Service—See "Indian Annals of Medical Science," Vol. iv., page 150,

shop is in any way to be deplored, yet every one practically acquainted with professional routine at home must acknowledge that the old system of the medical student passing a few years in the dispensary was of great benefit to him, and that those practitioners who, under more recent regulations, have not been obliged to make a closer acquaintance with drugs than that implied by one session's attendance on a course of *Materia Medica* lectures, often find, in themselves, and betray to others, a lamentable deficiency in the art of prescribing.

When we consider how nugatory is the greatest diagnostic skill of the physician if he be unprovided with appropriate remedies, or unfortunately ignorant of the way to remedy by medicines the disease his knowledge of the art of medicine has taught him, surely the theory and practice of pharmacy, as well as a thorough knowledge of *materia medica*, must be considered essential. Nor is it to him who has taken the speciality of medicine to whom pharmacy is alone necessary; the surgeon requires at least as complete an acquaintance with the resources of pharmacy as with the practice of operative surgery. One of my teachers, who, though a most excellent surgeon, was, through unsteadiness of hand, anything but a first-rate operator, nevertheless was a more successful surgeon than many of his colleagues, more skilful in operating. The reason was simple; a man of varied scientific attainments, he had been a very successful physician and chemist before changing to the surgical branch of the profession. The consequence was, that in cases of operation his happy after-treatment far more than compensated for his slight manual deficiency in operative skill. He did not consider his responsibility ended when the hernia had been released, or the calculus removed; a watchful eye and a sound knowledge of pharmacy steered the patient in the many dangers through which he had to pass.

A feeling of gratitude for the man who taught me not to follow the too common fashion of making a dog-latin prescription of drugs one knows nothing about, the sole result of medical skill has led me to this digression, yet I could never sufficiently repeat how necessary to the doctor is a perfect knowledge of the tools he uses in his work.

But of little use will be the most happily composed prescription if the art of the prescriber is to be marred by subsequently pharmaceutical ignorance, by the employment of



bad drugs, or by the drugs not being procurable. These are contingencies which rarely occur at home in civil practice, but of frequent occurrence both at home and in India in the practice of the Government medical officer. Nowhere more than in the army, does there exist a complete listlessness and happy-go-lucky system about the pharmaceutical arrangements. In the French service the qualified *pharmacien*, like the qualified surgeon, has to undergo a course of instruction at the Army Medical School before he can become qualified for employment, and the regularity and efficiency of the pharmaceutical branch of the Medical department is kept up by pharmaceutical officers of the various inspecting ranks. How the pharmaceutical department of the British service is managed I cannot say; I only know that my inquiries on the point have had no result, and the only apparent system is that there is no system. The drug department seems to be utterly unworthy of attention except when the drug-bill is to be paid, and the apparent absence of system would be borne out by an inspection of any Government dispensary at home or in India.

I will show that my remarks are not unfounded. In the Hospital Regulations (a work of which there seem to be few copies in India, and which is a dead letter here) there are three pages (Section XXIII) devoted to the subject of Surgical Instruments, Medicine Chests and Medicines, in which there is not a word about what medicines are supplied, or under what system they are chosen, or how their good quality is guaranteed. A form is given for requisition of medicines and drugs, but no information is given as to what other drugs are allowed beyond the scanty list afforded. In fact, there are no pharmaceutical arrangements.

I am but little addicted to polypharmacy, and prefer for my own part trusting to a few medicines whose action I know well to elaborating wonderful prescriptions in very bad Latin of newly invented drugs. But few medicines as I generally use, I was fairly astonished on entering the service at the poverty of the "surgery." It was not so much the poverty that astonished me as the poverty and riches intermixed. The numerous half-gallon bottles of quinine contrast most curiously with the shabby array of "*præparata ex ferro*." Citrate of Iron, Sesquioxide of Iron, and Sulphate of Iron are all the martial preparations. Three salts of iron, including a specimen of red ochre. At least

one would think that the pharmacopœial preparations would be allowed, considering the facilities at home for procuring them. But such is not the case. I remember at Fort Pitt, the head-quarters of the Medical Stores, prescribing some *Linimentum Æruginis* in a gargle. The prescription was returned; I endeavoured to adapt it to the resources of the establishment by substituting for the pharmacopœial liniment a prescription of verdigris, vinegar and honey. That was as unsuccessful; there was no *Ærugo* in store; thus I was obliged to renounce in disgust any prescription more far fetched than a black draught, or a dose of castor-oil. At the same time quack medicines, such as Warburg's Tincture, Browne's Chlorodyne, Boudault's Pepsine, could be had in any quantity, and the value of the quinine used exceeded that of all the other drugs put together.

One thing, however, I must say for the Home service, that the instruments are generally of very good quality. Would that I could say the same of those supplied to India!

My agreeable surprise on seeing the first page of an Indian Indent for medicines was rather tempered on coming to the end by finding that liberality in the number of medicines was amply compensated by the small number of useful medicines; and I found, before I had been long in India, that small as is the number of useful medicines allowed, smaller still will it have dwindled by the time the indent has passed the purging of the Division Office and the Medical Stores. I have watched the fate of the different medicines in the indent, and on comparing my indent with the Medical Storekeeper's invoice, the missing drugs are numerous indeed. Curiously enough pepsine, quinine, chlorodyne, copaiba, pil. hydrarg, seem to have charmed lives, while the fatal red ink dash and the black "none in store," fall heavily on the salts, the iron and the opium. Of course regulations must be abided by and extravagance should be checked, still an impartial examination of the indent shows that a very few ounces of quinine would have paid for many of the pennyworths so ruthlessly expurgated.

There is a 12 oz. bottle of quinine in my surgery, the cork has been untouched for months, and shall remain untouched as long as it is under my care. Its value is at least 30 rupees, yet I would willingly exchange it for 4 annas worth of Nitre. Of what use is the Valerianate of Zinc, the pepsine, and other drugs, as expensive as their value is

dubious, when I cannot get the drugs to relieve a common case of fever. However such is the case. A certain permanent settlement seems to have been made in the drug department under which every medical officer is expected to find every year, in every corps, the same diseases, and to treat them in the same manner. .

So much for the system of indenting for medicines. What shall I say of the instruments? The less said, the better; but between certain instruments which might be mistaken for the "apparatus" of Frère Côme or Paracelsus, did they not bear the name of Evans, Old Change, and those of Savigny, there is really nothing to choose. I can only say that Savigny, or his successors, Whicker and Blaise, would not dare to show in their shop the vile instruments sent out to India.

The contemplation of a case of tooth instruments marked with V. R. I., excites feelings of the profoundest sympathy for the wretched men whose jaws are to be tortured by these brutal instruments.

Three patterns of cases seem to be extant; I have all three, and will describe them. A common feature pervades all,—the multiplicity of keys and claws, and the paucity of forceps. On opening my capital case, I find a powerful key provided with 3 claws, 2 elevators of fearful construction, and 2 mis-shapen pieces of iron intended for forceps. The jaws of one are straight, in the other they are crooked, otherwise they possess the common character of simply terminating in 3 jagged points, roughened like a carpenter's prickers. No word can express their utter inaptitude for any purpose. In the other cases, there is a greater number of instruments, but no more variety. The number of keys and claws is greater, but the forceps are of very similar construction. Not one contains a forcep for either lower molars or bicus-pids. The key is a barbarous instrument, for before one can use it with anything like safety, a dozen teeth or jaws must be broken in experiments. A complete set of tooth forceps can be purchased in London for about thirty shillings, yet I will warrant that not one of the infamous cases supplied to the Indian Government cost less than double that sum.

Where are these drugs and instruments generally kept? In some small room, fitted with one cup-board and a few

shelves, for the delectation of the rats. The tinctures are in clumsy wine bottles, mostly *minus* their labels, extracts in gallipots with a piece of rotten leather faintly covering the mildewed mass within, powders in what are termed mustard and caper bottles. The shelves are loaded with brown paper parcels of long-ago rotten drugs, and anything like order seems unknown. Some dismay is at first created by the alarming labels of *Poison*, written in all the languages of Southern India, but the effect intended is completely marred, when it is found that Liq. Arsenicalis, and Carbonate of Ammonia, both bear the same placard. With these glaring yellow "*Poison*" labels, the "*Surgery*" looks somewhat like Morrison the Hygeist's representations of an Allopathist Druggist's shop, and the patients must be very much edified by the way in which they are served out "*Poison*" all round. I say "served out" intentionally, for each patient does not usually get his medicine given him out of his own bottle. The more common practice where there are few patients in hospital, is to make up each dose as required. It seems to be one of the comical Indian ways of saving trouble.

In this description I have merely stated what I have seen, and it falls very far short of the reality. Lavish expense on articles of questionable utility, expensive instruments of the worst possible quality, lamentable deficiency of the ordinary and cheap medicines, waste of stores through want of proper dry places to keep them in, disorder, and dirt, such are my impressions of a Government "*Surgery*" in this Presidency.

I propose a reform of this system.

1. I know not how the stores are procured from England, or what measures are taken to get good articles at a reasonable price. I can only take cognizance of the stores on their arrival in this country.

They should, on receipt, be rigidly examined. It would be well worth while for Government to entertain a Medical Officer competent in Chemistry and Pharmacy, for the sole purpose of examining the stores, and suggesting such measures of economy as the resources of this country permit of introducing. Many important medicines might be made in this country at one-quarter of the price they cost Government at present.

2. A proper list of drugs and stores should be made out,

modified from time to time, as necessary. Quack medicines should be rigidly excluded, but every Medical Officer has most certainly a right to employ any drug authorised by the British Pharmacopœia. This should be recognized as a principle.

3. A fair scale of Medical stores should be drawn up, adapted to Corps, &c., of different strengths. Besides a margin for unusual expenditures of medicines, of six months' extra supply, a certain amount of raw drugs might be added to meet contingencies. Thus, if towards the end of the year, a Medical Officer's stock of *Tr. Opii* for eighteen months were all exhausted, he might fairly be expected to make a tincture with his reserve stock of opium and country spirit. *Catechu*, *Cinnamon*, and other articles of the *Materia Medica*, might similarly be provided for the purpose of making preparations, if necessary.

4. All drugs should be contained in proper vessels. Consideration should be had for the climate. For instance, nothing ought to be kept in paper parcels on the Western Coast. I have known a 2 lb. parcel of *Pulv. Zingiberis* become completely tasteless in less than a month after its receipt. The practice of sending *Jalap*, *Rhubarb*, *Ipecacuanha*, &c., in paper parcels, is simply throwing away valuable drugs. Every drug sent from the stores should be, whenever possible, packed in a vessel which will contain it conveniently on the Dispensary shelves. Gallipots with leather covers are quite inadmissible. Proper extract-pots, with well-fitting lids, should be provided. Bottles for fluid drugs should be provided in every Dispensary, properly labelled, as they would be in any practitioner's Dispensary at Home.

5. The Dispensary should be properly fitted up. A cupboard for instruments and miscellaneous stores, a cupboard for poisons, and a proper set of shelves in a good light, should everywhere be provided. Bottles for the Wards should be provided in fair proportion; not the ordinary sort, requiring the detestable label, "Two table-spoonsful, &c.," but of the sort divided into 4, 6, and 8 parts, so that the dose can be accurately measured from the bottle. They cost no more than the plain sort.

6. An efficient dispenser should be provided. This would be best done, according to the British system, of encouraging

the Hospital Serjeant to learn dispensing. On his proving himself efficient, he gets one shilling a day extra pay. The Hospital Serjeant is generally a trustworthy man, and for many reasons I have every reason to believe that he is by far the best sort of Medical subordinate for the Army. The time is come when the Medical College should devote its energies to educating men for practice amongst the natives of India, and not to giving a Medical education to men whose real employment in the Army is to be office-work, writing and copying the tedious and voluminous reports of the Indian Medical Department.

Were encouragement given by Government, Provincial Medical Schools might be instituted for the education of natives, with, I believe, very happy results. If, in every large Cantonment, the Medical Officers were to give instruction to such natives as had attained a certain proficiency in English studies at the Government Schools, granting licenses to those properly qualified, I believe that much good might be done. At the same time facilities might be afforded for procuring medicines from the Government Stores, on payment. We should not then have that hole-and-corner way in which natives can often alone get relief, necessitating the troublesome stock and expenditure book. Gratuitous relief to natives from Dispensaries ought to be abolished. Before many years, it will become as great a nuisance as the hospital system is in England. The Medical education of a number of intelligent natives, and their distribution in Districts, would do much to attach the natives to the British rule. A certain small salary from Government for attendance on the indigent, and for vaccination, would secure the services of a qualified Native Doctor in every District, and he might attend, at a certain tariff, such well-to-do people as required his services.

But for this to be possible, Government must act liberally to Medical Officers, which it seems very far from willing to do at present.

The recent publication of the British Pharmacopœia affords an excellent opportunity for reform in the Pharmaceutical Department of the Madras Army, and it is earnestly to be hoped that something will be done to ensure an ample supply of good drugs and stores to Regimental Hospitals, and, at the same time, to put a stop to the waste now taking place.

ART. XV.—On Dogs, Dog-bite, and Hydrophobia. By J. J. WOOD, Assistant, Medical College, Madras.

[Read before the Madras Apothecaries' Society, on the 28th July, 1864.]

IN the last number of the *Quarterly Journal of Medical Science*, I attempted to direct the attention of the student of Hygiène to some sources of contagion and infection that appeared to me to be unsuspected or lost sight of: I now crave the patience of the Members of this Society, while I endeavour to lay before them a few of my thoughts on one of the sources of mortality, but too well known for ages; and which, by the simplest system of precautionary measures, might be almost completely removed.

The title of the paper I have the pleasure of reading before you this evening is—“*Dogs, Dog-bite, and Hydrophobia* ;” a subject, as you are all aware, more intimately connected with Medical Police than with any other branch of study.

That many animals, when rabid, are capable of communicating hydrophobia to man, has been proved beyond all doubt; and though instances now and again occur in this country from the bite of the jackal, the mongoose, and the bandicoot; and in other parts of the world from that of the wolf, the horse, and several other animals; yet, if I read aright, the greatest and most constant source of all has ever been the dog, and doubtless always will be, unless indeed that certain circumstances become greatly altered.

I have not been able, for sundry reasons, to learn any thing satisfactory of the statistics of hydrophobia, more particularly of Madras, but the readers of the *Medical Quarterly* will recollect the “run” of cases that were reported not long ago in certain numbers of that journal.

We learn there, that four cases of hydrophobia occurred at Madras between the months of May and August 1863. One of these was a Private (Æt. 29), of H. M. 69th, under the care of Dr. Whittaker: a second, a native male, Æt. 39, at the Vepery Dispensary, under Dr. Montgomery: and two others; one a boy, Æt. 9, the other, a girl, Æt. 5, both natives, at the Civil Dispensary, under Dr. Paul.\* Two

\* In the same journal we find that a case occurred in January 1861, reported by Dr. Mudge. This was a Portuguese female, Æt. 22, who received a bite on her way from Bangalore to Madras. And another case, reported by Dr. Lloyd, of an East Indian boy, Æt. 6, at Cocanada, in June 1860.

other deaths were reported to have occurred among the native population, out of hospital, much about the time that these cases were being published, but as I am not in possession of any reliable data, I shall say nothing on this point for the present.

Nor need I stop here to detail the cases I have witnessed from time to time in Madras and elsewhere, of bites inflicted both by rabid as well as by "healthy" dogs, and of the instances of worrying and mangling, that are common enough. But I may remark generally, that one of the commonest accidents we hear of in Madras, more particularly of late, is, unquestionably, dog-bite; and one reason why the European Surgeon does not meet with more of these cases, is, simply, that the native at once applies his time-honored remedy, viz., chunam or lime, followed by the milky juice of the Mudar, (*Calotropis gigantea*) or of the milk-hedge (*Euphorbia tirucalli*.)

It does not require very great powers of observation, or a very protracted experience either, to discover that, wherever there are numbers of loose dogs, we may expect to have cases of dog-bite constantly; and that whenever dog-bites are numerous, instances of death by hydrophobia will more or less frequently occur.

I propose, then, that we pass on to the consideration of the following questions :—

I. Are there many dogs in Madras ?

II. To whom do they belong ? Or, rather, who are the parties *permitted* to keep dogs ?

III. Are there any—and what—regulations regarding them ?

IV. How are the inhabitants protected from dog-bite ?

I shall consider the first two questions more or less together.

It would indeed be superfluous on my part to reply to the first of these, as not only every member present, but every inhabitant of the town of Madras, must answer it in the affirmative. Let those in authority who wish to test the truth of these remarks take an occasional morning or evening ramble (not drive) through the streets of Black Town, Chintadrapettah or Vepery; or, if during the dog-killing season, after dusk, and they will



then carry away some faint perception, not merely of their number, but of the degree of comfort—of safety, the pedestrian without a stick must feel, surrounded by a pack of dogs in the middle of a street. The appearance of a stranger in some parts of Madras is a certain signal among the canine watchers to “turn out the whole,” and the poor wayfarer has then not one dog to keep at bay, but perhaps a dozen.

Further, it is a pretty common complaint of servants and others that such and such streets are not safely passable at certain hours, from the presence of one or more savage dogs, (brutes well known for having bitten this, that, and the other person) and that they are, in consequence, often obliged to take a more circuitous route when going on business.

The dogs found about Madras and its suburbs may be arranged under three heads, viz. : 1. Those having owners : 2. Those having none : and 3. Those fed by a party of two or three native families, and claimed as their own or not, according as it suits them from time to time. The animals belonging to the two latter groups are frequently seen stationed in the vicinity of the petty markets, butchers’ stalls,\* &c.

*Every* man, either in Madras or in the Mofussil, may keep a pack of 10, 50, or even 100 dogs, if he is able and so inclined ; and there is no law in existence, as far as I am aware, to hinder him : there appears, at least, to be no limit, for every one keeps as many as he chooses.

It would, doubtless, be both amusing and instructive to learn the various reasons parties would assign, if questioned, as to their partiality for dogs. Many, possibly, keep them as a watch, because, forsooth, they are rich—have a larger share of this world’s goods than their neighbours ! Others, again, (one would suppose from what he witnesses) for the very humane purpose of tearing the rags off the already ragged, thereby preventing their hungry and poverty-stricken fellow-creatures from loitering about their premises, or otherwise disturbing their poetic tranquillity. Shades of Howard and Kiesling ! There are some sections

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\* I would recommend those who love the study of Natural History, or take an interest in dogs, to perambulate the streets of Madras ; where, in addition to most of the European varieties, they will find many more, including the well known straight-eared, ring-tailed pariah ; the sleek, hound-like poligar ; the noisy, dwarf castoorie ; and others, that would pose the genius, even of a Cuvier, to determine the origin of.

of the community, however, to whom these animals are truly and pre-eminently useful, and which I shall have occasion to refer to by-and-bye ; but the majority (I state it confidently) could give no reason at all for this predilection, at least, no sensible or satisfactory one.

It would really be worth the while of the authorities to ascertain, by some system of enquiry, the proportion of house\* dogs to the human inhabitants, in all the large stations belonging to this Presidency.

III. Are there any—and what—regulations regarding them ?

The only regulation affecting this dangerous nuisance that I am acquainted with, is, that certain small rewards are offered for the killing of all such dogs as are found straying about the streets during five months in the year, between certain hours each day.

This is a well-known regulation, and a most humane one we must admit it to be, only that it is liable to abuse—to fallacy, as I hope to shew in the sequel.

This killing of dogs is not commenced until timely notice has been given in the Gazette and Newspapers, in which individuals, desirous of preserving their dogs, are requested to have them tied up. From which we may reasonably infer that all dogs are *permitted* to go loose during the remainder of the year.

Some localities here may be said to swarm with these animals, and apart from their being sometimes a little more than a source of annoyance to the way-farer, they often deprive the sick and the weary of their sleep, by indulging in a barking or howling chorus half the night ; very agreeable, no doubt, to themselves, and of very little concern to their proprietors, as many of the latter punctually shut them out of the house at bed-time, for fear they should disturb the slumbers of the fatigued master, or frighten the baby. Good natured people ! who very likely act upon the adage that “charity begins at home !”

The last question that we have to deal with, must be considered the most important, as it is of greater concern to us, as citizens, than any of the others, viz. :—

IV. How are the inhabitants protected from dog-bite ?

I, for my part, need scarcely answer : In no way that I am aware of : and sufficient has been already brought for-

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\* Street-dogs would be a better term, more consonant with fact.

ward for concluding that it is a matter which has not yet received the attention or consideration it deserves. Irksome as repetition may be, let me repeat what is patent to the whole of Madras, that dogs are permitted to run about the streets the whole year, day and night, except during the dog-killing season, when they are kept chained during the day and let loose at sun-set, only to display a little more ferocity all night.

A poor horse-keeper or grass-cutter, found loquacious or unsteady in his gait, from a draught or two of toddy, after his unquestionably hard day's toil, is looked upon by the vigilant, conscientious peon as a disturber of the public peace, and is accordingly pounced upon by him; but it is as notorious that dogs may worry or even bite the passers-by, without any notice being taken of it by the functionary just alluded to.

Were I permitted to suggest, or had I the faintest idea that a suggestion, emanating from me, would have any weight with authority, I should certainly draw up a Code of Prophylactics against the cause of mortality in question; but as it is, I trust you will listen to what I have to advance at present.

To begin, then, I would say, that it might be ruled that—

*No permanent resident* of Madras or of any other crowded city, who could not shew good and sufficient reason for doing so, should be allowed to keep a dog; fancy or inclination should have no weight.

(It would be far safer to permit such of the inhabitants as had the means or the desire to do so, to keep cobras or tigers for their amusement, as they would then studiously and sedulously endeavour to make them secure, not so much probably from humane or philanthropic motives, as from selfish ones).

The only parties that should be permitted to keep dogs *any where*, and to whom the animals would be of some real value, are (a) those in the employ of Government, (Civil or Military), who are constantly or frequently travelling,—liable to be ordered off on duty to distant stations, passing through unsafe territories and the like, and often in charge of property of one sort or other, (b) those not in the service of Government, but who are in somewhat similar circumstances to the above; (c) and in the Mofussil, the shepherd, the thaliar, and the shikaree, seem to me to be the only men to

whom a dog or two, or even more, might in any way be useful or serviceable.

Many of our Officers, Civil and Military, possess dogs, sometimes a good number, which they train to accompany them in their shooting or other sporting exercises.

The chances of danger to the public from this quarter, are, *comparatively very trifling*.

These dogs (whose proprietors reside chiefly in garden houses far from the town), are either kept tied or in some way secured; at the same time, that they are under the charge of servants, familiarly known as "dog-boys." This sufficiently explains why we seldom or never see them strolling about loose on the public roads. Besides all this the owners are, from their education, sufficiently acquainted with the history, symptoms, and the danger of Rabies, to place them on their guard against anything like the occurrence of mischief.

If there exist reasons (of which I confess myself ignorant) against prohibiting dogs being kept in such numbers, then the next best remedy to be proposed is, the levying of a dog-tax at once. This would assuredly be a more merciful proceeding than many of the taxes, duties, or customs, which we so frequently read of, and more than that, sometimes heavily feel.

Objections might be started against the institution of the dog-tax, but permit me to assure all, and the authorities in particular, that a dog-tax does exist and has existed as far back as I can remember, with this difference only, that the money is not received into the public coffers.

The facts which I am now about to mention must be familiar to most of you here present.

A "dog-killer," (readily recognized by his huge club and peculiar style of head-gear) is appointed by authority, as far as I can learn, to each district, with instructions to kill all dogs found out of doors. But does he thus despatch every dog he finds straying? It is but too well-known he does not—that he spares those on whose account he has previously received a *present*, I had almost said—bribe. This present, very similar to a tax or custom, is given him by many, rich and poor, living in the heart of Madras. The sum for the season is never less, I suppose, than the reward offered by authority, though it sometimes amounts to several rupees. This is granted even by some of those who

tie up their dogs, for fear the animals should by any accident get loose. In these cases, the dogs, if found in the streets by the dog-killer, are duly brought back by him and restored to their owners: and this he will sometimes condescend to do for those who do not pay him: this act of grace, however, he performs but once only; if the fee be not forthcoming, the doom of the dog is sealed, the moment he crosses him again.

Besides those mentioned above, there are other dogs also which are spared by the dog-killer, as those of his neighbours or acquaintances, and others that he would not like to lose favor with. Again, if I am rightly informed, he never has the courage to venture into the "lines" of a Native Regiment for certain very sound reasons, so that the dogs belonging to the sepoys walk about at large.

On the other hand, it is well-known that the dog-killer is now and again hindered in his work and deprived of his fee by the passers-by, for the moment that he is seen stealing on a sleeping or unsuspecting pariah, a shout is raised by several voices at once, followed by a few stones, with the intention of scaring him home, provided he has one.

This, the Hindoo considers a very praiseworthy action, and accordingly takes any amount of credit to himself, for having been so serviceable in the cause of, what he calls, "dumb life."\*

Taking every circumstance into consideration, I think the time has arrived in Madras, when the institution of a tax (combined, of course, with stringent regulations) would prove, not only a blessing to the inhabitants, but at the same time add somewhat to the revenues of the State; a great deal more, I should suppose, than that on sheep, goats, pigs, &c. which, it appears, is at present contemplated. And this tax (if any good is intended) should be heavy enough to be felt by the majority of dog-fanciers. No other tax, toll, custom, or duty in existence, should be placed in comparison with that which we are now considering. Can any reason be assigned why a heavy tax (I would make it the heaviest of all taxes) should not be levied on such a nuisance as dogs, loose at most times,—in 99 out of every 100 instances of no earthly use to their *careless* or *indifferent* owners, at the same time that they are so dangerous among a crowded community?

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\* Literally, "living creature without a mouth."

In case that the authorities are loth to take into consideration what has already been advanced, and that they will still adhere to the good old system of dog-killing, then all I would recommend in connection with it would be, that the operations be continued all the year round without intermission; and that instead of the paltry sum of 2 or 3 annas offered for the killing of each dog, that the sum should be three or four times the number—of *rupees*, or even more; and very little necessity would exist for the continuance of the system after the first year or two. But unless this plan, promising as it appears, be carried out under the strictest surveillance, it is open to sundry objections, as will be readily seen by the authorities themselves.

Whatever be the plan or plans ultimately adopted, the one great object to be aimed at—to be kept in view—is, the *prevention* of dog-bite, and, therefore, its consequence,—Hydrophobia; by diminishing the number of dogs in some way or other, and insisting on the confinement (within the houses of their respective owners) of all such animals as are allowed to live. No dog should be seen, at any time of the day or night, in the street, unless he is chained, and led by a servant, as is always done by those who value these creatures. It might be ordered that every animal found loose in the street or other place out of doors, in Town or Cantonment, if not killed, should render its owner liable to a heavy fine for the first time, and a heavier one on each succeeding occasion; and no matter what the price or other value of a dog, the animal should be forfeited by the owner the moment a complaint is lodged of its having bitten anybody.

It would be anything but an infringement of the golden rule, for owners of dogs to muzzle their pets securely: the *bark* of the dog is *sufficient* under all ordinary circumstances, whether in the house or out of it,—the *bite* is *seldom* necessary.

I remember having read of a French Professor recommending the putting on of a mask over the head and muzzle of the dog, made of strong wire gauze;—a plan, simple as it was ingenious; and, might I not add, ingenious as it was charitable?

There are, it is well known, a good many, quiet, happy people, perfectly satisfied that “whatever is, is right;” and who, therefore, would look upon these remarks of mine as an intrusion,—as an unpardonable attempt at innovation.

These people are as averse to improvement as the very Hindoos themselves: and one argument that might be put forward by them—a lame one, indeed—is, that hydrophobia, as compared with other diseases, is very uncommon, and that, therefore, little or no necessity existed for making such a noise about it.

It is true that some medical men saw more of the disease lately in Madras than ever they did, (in all their travels about the country,) but can any one guarantee that there will not be as many cases,—nay, that there will not be more, by the end of another year? Time will tell. And are we to wait and see?

I am perfectly satisfied, from my knowledge of the country, of the native, and of the subject in question, that hundreds of cases occur annually all over the stations and villages of our Presidency, Madras included, that we never hear a word of. Many of these cases, doubtless, are looked upon by the Vythean and friends as “fits,” “madness,” “brain-fever,”—in fact, anything but the result of dog-bite. And, supposing, for the sake of argument, that some at least of the cases are correctly diagnosed, how is it likely we should hear of them, since the Vythean (here or up-country) sends in no returns?

If we had hydrophobia constantly occurring, or occurring in large numbers at a time, like cholera, and some of the victims other than Europeans in the humbler stations of life or the poorer natives; every precaution would, in all probability, be taken, even to the destruction of all the dogs and cats in the land, in order that the disease might be eradicated: but may we not respectfully ask;—with whom rests the moral responsibility of the deaths that happen, time after time, few though they are *reported* to be.

A comparatively small number of our citizens, I imagine, particularly natives, know anything of rabies, more especially its *earlier symptoms*, and yet numbers have more dogs than one. Now, I do not think it requires much reasoning to shew how one of these family pets, when affected by the disease, may leave home without the knowledge of the owner, and wander about the streets for days, sowing the seeds of death among our species by biting one here and there, at the same time that it is perpetuating the virus by communicating it to other dogs. Who is accountable for these things? On whom rests the onus of blame? Nobody? Certainly, some would say, not on the owner, for

had he been aware that the dog was about to leave his premises, he would have had him tied up; or had he the most remote idea that the animal was rabid, he would have had him killed. Since he was aware of neither, we may be asked, how could he be blamed? Who then are the culpable parties?

Dogs may, without exaggeration, be compared to so many loaded spring-guns, liable to go off unexpectedly at any moment, and destroy either life or limb: and accordingly, the permitting of dogs being kept *loose* by thousands of ignorant persons in a crowded city, is about as safe as putting fire-arms into the hands of children as toys!

A very flattering encomium was uttered regarding the British Government in India, by a stranger—a Rajpoot pilgrim, who met me accidentally on the high-way; and after calling my attention with the usual—"Ghareeb parvur!" said something to the following effect:—"The sheep may fearlessly drink water at the same tank with the tiger, under your rule." This the learned would call an oriental-ism; but interpreted, it means, if it means anything at all, that, according to our laws, no man can, with impunity, molest or interfere with another, no matter what his caste, rank, or position in life. And is not this true?

Why, then, one naturally asks, should any unoffending way-farer (even admitting that hydrophobia was a myth), sustain a bite from a dog, and on such public ground as a street? And be bitten, I might say, with impunity? For it is a fact, that a variety of circumstances militate against the obtaining of redress from the Magistrate by the poor man, be he a cooly, a postman, or a house-servant. Setting aside the want of leisure, of means, and so on, it is not always that the owner of a dog is discoverable.

If a man loses his life by the hand of *another*, you are fully aware of what will follow: and is no further notice to be taken of the deaths from dog-bite, that occurred here under our own eyes, of parties, who would, in all human probability, have been alive and well this day?

It was very gratifying to learn from the papers lately, that orders had been issued for the extermination of the prickly pear from within the boundaries of Madras, on account of its being so safe a cover for snakes. Is not this a preventive measure?

No expense or pains is spared in endeavouring to extend vaccination through the length and breadth of the land;



and is it not with the view of lessening the mortality from small-pox ?

Need I tell you for what reason the man, furious from drink, is confined,—and the lunatic permanently separated from society ?

The disarming of the population of a district—the being compelled to give up the possession of firearms and other weapons by a people, may be reckoned a political necessity, but it is, nevertheless, a sanitary measure.

What is it that has been left undone, in order to abolish “human sacrifice,” to prohibit the “suttee,” and to bring to an end “female infanticide?”

Why, then, should so easily preventible a death as that from dog-bite be permitted to recur, again and again, while the pen of the sanitarian and the strong arm of authority can prevent it? If it were that only one man fell a victim to hydrophobia during a century, would it not be consonant with the principles of justice, of humanity, to adopt the necessary prophylactics?

Every man, with even moderate powers of observation, who has whiled away his leisure hours reading, cannot but be impressed with the intelligence and high moral qualities of some varieties of the dog, as detailed by Youatt and other writers, but all that will not divest the mind of the professional man of the fact, that *a dog is a dog “for a’ that,”* and the cause, often enough, of the most dreadful affliction, both to mind and body, at the same time that it is one of the most fatal that “flesh is heir to.”

My sentiments on this subject may certainly not have much weight, but I shall, nevertheless, sum them up by saying, that I would sooner see the whole race of our faithful companions—the dogs—exterminated at one stroke, rather than permit, by neglect of precautionary means, the death by hydrophobia, of the most miserable fellow-creature that ever lived.

And breathes there a man who would not ?

They only who have watched by the death-bed, and contemplated the sufferings of the doomed one, can enter into the spirit of the above, or endorse such sentiments !

## PART II.

### REVIEWS AND NOTICES OF BOOKS.

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*A Manual of Ophthalmoscopic Surgery.* By JABEZ HOGG.  
London: JOHN CHURCHILL AND SONS, 1863, 3rd  
Edition.

THE great importance of the eye as the organ of vision need not be dilated upon; it is felt by all. All are, therefore, alike interested in the success of those investigations and of those means, by which disease of the organ may be averted or cured, by which its defects may be remedied, and its functions preserved. How much of misery is expressed by the simple phrase "loss of sight." The poet Schiller makes Melchthal say, when he hears that his father's eyes have been put out;

"O eine edle Himmelsgabe ist  
Das Licht des Auges!—Alle Wesen leben  
Vom Lichte, jedes glückliche Geschöpf!  
Die Pflanze selbst kehrt freudig sich zum Lichte;  
Und er muss sitzen, fühlend, in der Nacht,  
Im ewig Finstern;—ihn erquickt nicht mehr  
Der Matten warmes Grün, der Blumen Schmelztz;  
Die rothen Firnen kann er nicht mehr schauen,  
Sterben ist nichts; doch leben and nicht sehen,  
Das ist ein Unglück!"

WILHELM TELL.

Of late years, and under the genius, principally, of the German school, the study of the eye, both in its normal and abnormal conditions, has made remarkable progress. The investigation of its diseases and defects is no longer confined to the Oculist, but forms part of the studies of the Physician, the Surgeon and the Mathematician. Important as are the investigations which are limited to the organ itself, yet equally important, perhaps, is the light which these studies throw upon the principles and practice of medicine generally. In the case of the organ

of vision, disease becomes visible; it can be traced by the observer from its early beginnings, through its progress, unto its very termination; inflammation with its exudations, congestion with its results, morbid degenerations with their products can thus be accurately investigated because clearly seen. And not only so, but the transparent cornea permits us often to study the exact influence upon the course of disease exhibited by remedies, and so enables us to correct or confirm our views on important questions of therapeutics.

The eye, moreover, suffers from diseases which affect the system as a whole; the poison of syphilis, for example, leaves its evidences upon that organ, and various blood diseases may be diagnosed from the characteristic morbid appearances which the fundus oculi reveals under the ophthalmoscope<sup>(1)</sup>. With the brain, the eye is in immediate connection; of the nine cerebral nerves, the second, third, fourth, part of the fifth and sixth nerves pass into the orbit, whilst, as regards nutrition, the circulation of the eye is but part of that of the encephalon. By the ophthalmoscope alone can we gain a glimpse of the cerebral circulation, and it is in this direction, we feel convinced, that the next great stride in cerebral pathology is most likely to take place<sup>(2)</sup>. Already has the condition of the retinal circulation, during sleep, been made a subject of study, and new enquiries into the state of the circulation, in cases of epilepsy and cerebral disease, are being diligently prosecuted. In short, to quote Mr. Hogg, page 156, we may say,

"The use of the tongue in determining the condition of the stomach is not more available now, than the corresponding resource in affections of the brain which the possession of the ophthalmoscope affords. The different phases of congestion, from the first sense of fulness, weight or heat in the eyes after exertion, to the more distressing symptoms of retinitis, appears to me a wide field for further observations in this direction. As has been justly observed by Mr. Swan, 'In diseases the retina sympathises directly with the brain through the visual track producing either an increased sus-

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(1) Beautiful illustrations of these facts are to be seen in the "Atlas der Ophthalmoscopie" of Dr. Richard Liebreich, of Berlin.

(2) For an account of the value of diseases of the eye in the investigation of intra-cranial disease, see Clinical remarks by Dr. Hughlings Jackson, *Medical Times*, for April 1864.

ceptibility from excitement, or a dullness from debility and oppression. It sympathises through the involuntary tract with the par vagum in disorders of the lungs or stomach, and in a less degree with the par vagum in disorders of the heart and part of the intestines which are more fully supplied by the sympathetic nerve. It sympathises with the sensitive tract through the sentient nerves in disorders of the skin and conjunctiva. It sympathises least of all with the parts chiefly supplied by the sympathetic nerve, and, only, through the filaments of this nerve given to the ocular artery in common with the rest of the internal carotid supplying the brain."

Diseases of the heart and great vessels leave their pathological traces in the eye, and embolism, which is diagnosed with difficulty in the pulmonary artery or cerebral vessel, may be *seen* in the case of the retinal arteries. Diseases of the kidney may be diagnosed from the existence of diabetic cataract, as well as from the special pathological appearances which Bright's disease induces in the structure of the Retina<sup>(1)</sup>. The eye sympathizes intimately with the mucous tracts of the intestinal and pulmonary canals, as well as with the general cuticular envelope of the body; inflammations of the mucous membrane of the nares spread at times to the conjunctiva, and vice versâ, inflammations of the conjunctiva spread downwards to the nares, through the canaliculi, lacrymal sac and nasal duct. The chronic conjunctivitis of the dyspeptic and strumous patient is well known; pustular and phlyctenular ophthalmias from vermination are of daily occurrence, and the sympathy of the ocular mucous membrane with the functions of the uterus, is a fact well known to the practical physician.

Sufficient has been said to shew that the study of diseased states of the organ of vision has an important practical bearing upon general medicine and surgery. It is much to the advantage of science that diseases of the eye are no longer avoided by medical men, and handed over to the cruel mercies of ignorant pretenders. There is nothing in the diseased conditions of the eye which the ordinary medical man may not treat successfully, nothing in the manipulations on the eye which the surgeon may not attempt, provided he has the delicacy and steadiness of hand required for such operations. Many a fact in medicine,

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(1) See Liebreich's Atlas Tab. ix. x.

surgery, and therapeutics, which the student must take for granted, might be made visible to him, were he closely to study the course and results of morbid action as they present themselves in the organ of vision. In this city, at least, the medical student has no reason to complain; ophthalmology forms part of his curriculum, and the Eye Infirmary, one of the noblest institutions in Madras, affords him a wide and valuable field of medical and surgical observation.

Physical diagnosis has inaugurated a new era of medical science. What the stethoscope and pleximeter have done and are doing for the chest and abdomen, the speculum and laryngoscope for the outlets and inlets of the body, the ophthalmoscope is doing for the organ of vision. The dream-land of disease and therapeutics has been invaded, uncertainty is giving way to certainty, and *I see* is taking the place of *I suppose*. As regards the eye, the study of its diseases by the aid of "sense-helps" is as yet in its infancy; there is plenty of room for more observers; great as the progress has been within the last few years, a wide field of observation and discovery still remains all but unexplored.

We turn now to the work, the name of which heads our review. Mr. Hogg's Manual of Ophthalmoscopic Surgery has reached its third edition, sufficient evidence of the importance attached to its subject by the profession. It professes to be a practical treatise on the use of the ophthalmoscope in diseases of the eye, and is one, certainly, which, taken as a whole, deserves the consideration of all who make the subject of diseased conditions of the organ of vision their special field of study and practice. The chromolithographs intended to illustrate the normal and abnormal conditions of the fundus oculi as revealed by the ophthalmoscope, are very miserable and sadly misleading specimens of the art. Should a fourth edition of his work be given to the world, we would suggest to Mr. Hogg the necessity of substituting Day and Son, Chromo-lithographers to the Queen, for Cocking and West. The illustrations of the work generally, are very poor, but the chromo-lithographs are failures, not only as artistic representations but also as illustrations of morbid changes.

The first four chapters of the book under review, are confined to subjects of scientific interest, connected with

tion of the ophthalmoscope; its construction; the optical principles involved in its use; the structure of the eye and of its several tissues; the function of vision; the objective and subjective examination of the organ, and the general principles by which to distinguish the seat of morbid changes in the internal eye. On all these points, a fair resumé of what is known is given. Prevost's demonstration in 1810 of the cause of the mirror-like reflection of light, which emanates from the eye of certain animals, studied and practically applied by our countryman Cumming in 1846, led to the discoveries of Helmholtz, Erlach, Bruecke, and others, and to successive improvements in the form and construction of the ophthalmoscope. The original ophthalmoscope of Helmholtz is not now in use, those of Coccius, Zehender, Liebreich, Anagnostaki, or the binocular of Nachet being the instruments generally employed by oculists. Nachet's binocular ophthalmoscope we find to be a very useful and easily managed instrument for ordinary purposes, but for careful research and, as a means of enabling the non-professional artist to depict with fidelity the fundus oculi, no form of ophthalmoscope equals that of the larger instrument invented by Liebreich, and represented at page 13 of Mr. Hulke's practical treatise on the use of the ophthalmoscope. The author gives a drawing and description of a fixed ophthalmoscope of his own invention, which differs in form and detail though not in principle from that of the German oculist.

In the chapter on "the nature of light," the following interesting experiment, shewing the capacity for absorbing heat rays possessed by the vitreous humour, deserves to be reproduced here :—

"Professor Tyndall proved that the eye possesses a wonderful provision for the exclusion of heat rays. He found, beyond the visible spectrum in both directions, rays which excite no impression of light. Those at the red end excite heat, but no light; and the reason why they fail to excite light in the eye, is, probably, that they are never permitted to reach the retina. To show this experimentally, a thermo-electric pile was placed near to the red end of the spectrum, but still outside of it; the needle of a large galvanometer connected with the pile was deflected and came to rest in a position about 45° from zero. The transparent vitreous humour of the eye of an ox was now placed in the path of the rays, the light of the spectrum was not perceptibly diminished, but the needle of the galvanometer fell to zero; thus proving that the obscure rays of the

spectrum, to which the galvanometric deflection was due, were wholly absorbed by the humours of the eye."

We were taken a little by surprise when the wood cut at page 40 representing an enlarged vertical section of the eye first met our view; the anatomical details differ essentially from those laid down by Bowman, Nunneley, &c. Our author's diagram is, in fact, almost unintelligible. To take one point alone as an illustration, we would direct attention to the position and relations of the ciliary muscle, as indicated by our author, compared with the well-known section in Bowman's lectures on the parts concerned in the operations on the eye; with Nunneley's section,<sup>(1)</sup> with Ecker's beautiful "*Icones Physiologicæ*,"<sup>(2)</sup> or with Donders' sketch<sup>(3)</sup>. The author is well aware of the discrepancy, regarding which he makes the following remarks:—

"I must here observe that my diagram of the sectional view of the internal eye (although a little exaggerated by the artist), differs considerably from that given by Mr. Bowman; inasmuch as I have not been able to make out the expanded form of the ciliary muscle as he represents it, but, on the contrary, I find the ciliary muscle and processes, as well as the suspensory ligament as it approaches the lens, so intimately associated with the vascular choroid, that it appears to me better to describe them as a whole under the name of the choroidal system, as having reference to their action and functions in combination."

Speaking of the cornea, our author gives some interesting details regarding its nerve supply:—

"Schlemm was the first to demonstrate the presence of nerves derived from the *nervi ciliares* and passing into the fibrous layer of the cornea. From twenty to thirty, or more, trunklets are distinguishable round its border, forming a numerous and wide-spreading network, extending throughout the whole cornea. 'Bifurcations of the original tubes present themselves but rarely in the trunks of these nerves; and never in the plexus formed by them—the actual condition of which, however, can scarcely be fully investigated, on account of its translucency. This plexus lies in the proper cornea, but nearer to the anterior surface; and since no trace of free terminations of nerve-fibres can be seen, it would appear to consist solely

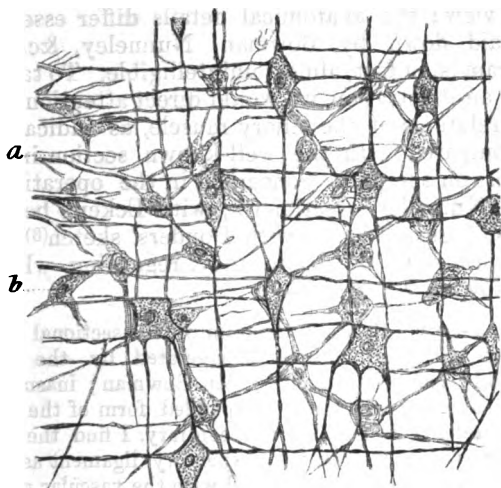
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(1) Nunneley on "the Organs of Vision," page 176.

(2) See Soelberg Wells on "Impaired Vision," pages 6 and 8.

(3) On the anomalies of accommodation and refraction of the Eye—New Sydenham Society, 1864, page 24.

of anastomosing twigs of the finest kind ; therefore, if not in the form of loops, still some connection of the nerve-tubes with one another may be assumed.



Nerve and stellate cells of cornea, magnified 300 diameters.  
a, Nerve cells. b, Stellate cells.

“ Dr. His describes and figures a somewhat similar arrangement of the nerves of the cornea ; but he denies their distribution throughout the stellate structure, as shown in my illustration. I therefore think it desirable to give this anatomist's views.”

“ The greater part of them,” he writes, “ are derived from the posterior ciliary nerves, the lesser from the small trunks of the conjunctiva bulbi. On entering the cornea, their branches are partly filled with tubular matter ; some have a dark double contour ; others, a pale colour, evidently containing nuclei. In this respect there is no prevailing rule ; as one may occasionally observe pale gelatinous fibres entering side by side, or in the same trunk with fibres containing dark tubular matter.

“ In every instance, however, the fibres which, on entering, presented a dark contour, very soon lose their medullary contents, become pale, and, in their further progress, show pale, granulated, oblong or staff shaped nuclei. At varying distances from their entrance, the small trunks either separate into equal branches, or send off a single fasciculus of a few fibres, occasionally even a single fibre only. The secondary small trunklets again anastomose ; and, after



splitting up into numerous branches of smaller size, unite by means of their branches, and form a larger network, spreading throughout the cornea. Within these small trunks of medium calibre, one has the opportunity of observing divisions of primitive fibres, and these divisions usually take place near the nucleus. In the minute fibres, the division takes place in such a manner, that at every point of division a small triangular enlargement presents itself, in which is seen a small nucleus. In tracing more closely fibrillæ arising from the division, one may observe that they do not show an abrupt termination, but proceed to, and enter, a similar triangular enlargement as those from which they took their origin; so that they form a network of most minute fibrillæ, as Kölliker conjectured. The triangular enlargement may probably be looked upon as a kind of ganglionic nerve-cell.

"With the cells of the cornea, and their offsets, the nerves do not stand in any anatomical relation. The accurate observer cannot well mistake the smaller fibrillæ for the tail-like processes (offsets) of the corneal cells; the nerve-fibres being distinguished by their peculiar brilliancy, their straight course, and (excepting the nucleolated enlargement) their unchanging calibre. In doubtful cases, the criterion would be that of tracing the connection of the fibres with the chief nerve-trunk. In regard to the extension of the nerves throughout the thickness of the cornea, it is a very limited one; and it was an erroneous conclusion of Strube to admit the presence of nerve-fibres in all the strata of the cornea. Accurate investigation shows that branches, dipping even into the deeper strata of the cornea, very soon come towards the surface, and spread into terminal divisions there.

"The chief seat of the nerves of the cornea is in the anterior third of the membrane, and it is only exceptionally that single trunks are to be found in the deeper portions; in the posterior third, probably none. The most minute ramifications take place immediately below the surface, and to this it is owing that we see those small branches which remain in the deeper portions forming sharp angles.

"The nerves of the cornea in their primary arrangement consist of fusiform cells, with long oval nuclei, as shown in a human foetus at the end of the fifth month.

"His, it will be seen, denies the existence of nerve-cells in the strata of the corneal substance. I believe that these nerve-cells are connected with the nerves of Schlemm; and although my sections do not always show the regular-looking reticulated arrangement represented by the artist in *fig. 8*, which arises from the great difficulty experienced in cutting fine sections of so delicate a structure, nevertheless there is no difficulty in making out the nerve-cells, with well-defined nuclei, embedded in granular matter—seen at *a*—as separate from the layer of stellate cells, *b*. It is most interesting to

compare the characteristic identity of the nerve-cells of the cornea, although so much smaller, with the very similar appearance of those displayed in sections of the nerve-cells of the cerebral substance, and of the spinal column. The repetition of the same formed bodies is an evidently organized system of distribution, is too apparent and significant to admit of dispute, and doubtless have an important bearing upon the perfection of accommodation, as well as that of either separating, admitting, or arresting only just those rays of light that are necessary to good vision."

The existence of nerves in the tissue of the cornea, might have been gathered from the exquisite sensibility of that organ under superficial abrasion of its epithelial layer, from some forms of superficial spreading ulceration, and from the exquisite agony which attends that minute vesicular eruption of the organ, which we would designate *herpes of the cornea*. Anatomical investigation has now proved the presence of a dense network of nerve fibres in the anterior third of the organ, which nerves are derived, principally, from the fifth pair and from the sympathetic. From anaesthesia and paralysis of these nerves, various forms of degeneration and ulceration of the cornea are supposed to take their origin.

Our author has some interesting and suggestive remarks upon "the choroidal system," under which term he includes not only the choroid properly so-called, but its continuous and colligated structures the iris, ciliary processes, ciliary muscle and ligament.

"Considered as a whole, therefore, I am inclined to believe, from its situation, its structural character, and the probable nature of its office, suggested by all the surrounding circumstances, that the vesicular system, which includes the choroid, the iris, and the ciliary processes, belongs to that class of erectile tissue which nature has specially provided to meet very opposite contingencies of blood-supply, occurring under conditions of great uncertainty. The structure and presumed use of the spleen, as the supplemental blood-reservoir, preserving the equilibrium of circulation in the stomach, whether at rest or during active digestion after a full meal, offers an analogy for the purpose of illustrating this point. Now, as the waking eye is sustained by ordinary means always in a state of watchful attention, resources of an extraordinary character are required to meet circumstances of particular and earnest gaze, most frequently called up by mental emotion, sometimes by instinctive impulse, like a blush in the capillaries of the skin, and also by particular efforts, voluntary and involuntary, made to perfect sight by the necessary adjustment of the dioptric apparatus of the eye. This appears to me the great purpose of the choroidal vascular system, which, by a sudden and

peculiar effort becoming distended with blood, materially alters the relative position of the parts concerned, and which again assume their quiescent position by a corresponding collapse, when the necessity has passed away."

According to this view, one action of the ciliary muscle must be to regulate the state of fulness of this ocular "spleen," the choroidal system. The close connection of the ciliary muscle and iris, as well as the general value of the choroidal system in effecting the adjustment of the eye, are thus dwelt upon:—

"In fact, some very accurate observers do not hesitate to say, that the anterior surface of the iris is a prolongation of the ciliary muscle, extended as it were over a reflected portion of the choroid membrane, which, together with its pigmental coat, constitutes the whole structure of the iris. Moreover, this important adjusting accessory of sight, the iris, by its delicate sensitiveness and mobility, exhibits the chief characteristics of the two-fold structure of the choroid coat of the eye; we may, therefore, infer from the nature of its duties, which are to regulate the amount of light admitted into the eye, and to preclude all rays but such as pass through the more central portion of the crystalline lens, that the choroid coat and its ciliary accessories, including the muscle, to which in its structure it is so intimately allied, are also included in the means provided to ensure the accurate adjustment of the eye, by assuming a condition of action or repose, accordingly as a sensitive retina measures its need for the due focusing of the rays of light, as coming from a near or distant object. This excitement of the choroidal and ciliary vessels is quite analogous to corresponding experience elsewhere, and in a very similar structure. The presence of food acts, unconsciously to us, upon the salivary glands, to prepare the stomach for its due reception; and there can be little doubt that in some such manner light affects the condition of the choroid and retina, so as to admit, by anticipation, of a proper adjustment for the perfection of vision."

In the structure of the iris, as of that of the ciliary muscle, we find two sets of fibres, one longitudinal<sup>(1)</sup>, the other circular; these fibres stand in an antagonistic relation to each other as extensor and constrictor annuli circularis, and as dilator and sphincter pupillæ. It has been shewn, we believe, that the radial fibres of the iris are connected if not continuous with the longitudinal fibres of the ciliary muscle, and

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(1) Donders expresses a doubt whether these radiating fasciculi of fibres of the iris can be demonstrated; the fibrous bundles appear to belong to the vessels; he has not satisfied himself that fibres exist separate from the vessels. Most anatomists, however, admit their presence.

although there can be traced no continuity of the circular fibres of the ciliary muscle with those of the sphincter pupillæ; still their correlation of function is something more than a mere probability.

The following remarks, quoted by Mr. Hogg from the "Quarterly Review," embody the views of Professor Draper and others, on the probable mode by which rays of light, proceeding from an object "produce a sensation upon the retina, and convey a knowledge of its presence and character to the brain."

"Instead of regarding the retina as composed of layers, however, we are now generally agreed in considering that the fibres of the optic nerve pass *radially* through the retina. Thus, from the fibres a thread passes downwards till it meets a cell of the vesicular layer; this, in turn, is in connection with a granule of the granular layer, which terminates in a cone and rod—these latter forming the real termination of the optic fibres on the pigment layer of the choroid coat. It is now held that the rods and cones are the percipients of light, which they communicate to the cells of the vesicular layer, thence to the optic fibres, and thence to the optic ganglion. The point to be borne in mind, in this description, is that the sensitive part of the retina is not the surface on which the light immediately falls, but the surface which is in contact with the black pigment.

"So that if we suppose an image to be formed on the retina, it will not be transmitted to the brain; but it will excite the specific sensations of which the optic centre is alone capable, and *these* will be transmitted. But it will be easy to prove that no images can be formed on the surface of the retina. In the first place, the retina, during life and health, is as transparent as glass. The rays of light must therefore pass through it and enter the pigmental layer, which, being perfectly black, absorbs all the rays. Further, it has been proved that the optic fibres are *totally insensible* to light. There is the 'blind spot' where the optic nerve enters, and where nothing but nerve fibres exist. There is also a spot in each eye where the sensitiveness to light is at its maximum; and this is a mass of cells, without a continuous surface layer of fibres. The especial part for the reception of light rays, out of which the necessary images are formed, Professor Draper maintains to be the *pigment layer*. To prove that this is the real optical screen on which the images are formed, he reminds us of Franklin's experiments of placing variously-colored pieces of cloth in the sunlight on the snow, and so arranged that the rays should fall on them equally. After a certain period, he examined them, and found that the black cloth had melted its way deeply into the snow, the yellow to a less depth, and the white scarcely at all. The conclusion which he drew has since been

abundantly confirmed : namely—that surfaces become warm in exact proportion to the depth of their tint ; because the darker the surface, the greater the amount of rays absorbed. A dark surface, absorbing all the rays, becomes the hottest. This principle Professor Draper invokes in his examination of the eye ; and he insists ‘ that the argument against the retina being the screen on which images are formed, is, both optical and anatomical, perfectly unanswerable. During life, it is a transparent medium, as incapable of receiving an image as a sheet of clear glass, or the atmospheric air itself ; and its sensory surface is its exterior one : this is the one nearest the choroid coat. But the black pigment, from its perfect opacity, not only completely absorbs the rays of light, turning them, if such a phrase may be used, into heat, no matter how faintly that may be, but also discharges the well-known duty of darkening the interior of the eye. Perfection of vision requires that the images should form on a mathematical superficies, and not in the midst of a transparent medium. The black pigment satisfies that condition ; the retina does not.

“If the retina is insensible to the light which passes through it, it will be equally insensible to the light which is reflected from the pigment layer. On the other hand, although the pigment layer is capable of absorbing light, we cannot suppose it also sensitive to light. How then is the luminous sensation produced ? Professor Draper furnishes an answer to this :—‘The primary effect of the rays of light upon the black pigment is to slightly augment its temperature, and this to a degree which is in relation to their intensity and intrinsic colour—light which is of a yellow tint exerting the most energetic action ; and rays which correspond to the extreme red and extreme violet, the feeblest. The varied images of external objects, which are thus painted upon the black pigment, raise its temperature on becoming extinguished, and that in the order of their brilliancy and colour. *In this local disturbance of temperature, the act of vision commences* ; this doctrine being in perfect harmony with the anatomical structure of the retina, the posterior surface of which is its sensory surface, and *not the anterior*, as it ought to be, if the explanation usually given of the nature of vision is correct ; and therefore, when we pass the tip of the finger over the surface of bodies, and recognize cold and warm spaces thereupon, the same process occurs, with infinitely more delicacy, in the eye. The club-shaped particles of Jacob’s membrane are truly tactile organs, which communicate to the sensory surface of the retina the condition of temperature of the black pigment. Professor Draper’s experiments satisfactorily prove that all photographic effects result from an increase of temperature. ‘The impinging of a ray of light on a point, raises the temperature of that point to the same degree as that possessed by the source from which the ray comes ; but an immediate descent takes place through conduction to the neighbouring particles. This conduct-

ed heat, by reason of its indefinitely lower intensity, ceases to have any chemical effect; and hence photographic images are perfectly sharp on their edges. It may be demonstrated that the same thing takes place in vision; and in this respect it may almost be said that vision is a photographic effect, the receiving surface being a mathematical superficies, acting under the preceding condition. All objects will therefore be definite and sharply defined upon it; nor can there be anything like lateral spreading. If vision took place in the retina as a receiving medium, all objects would be nebulous on the edges.

"To explain the process by which the change of temperature in the pigment becomes a luminous sensation will not be difficult, if—remembering that the luminous sensation is not one depending on the specific stimulus of light, but on the specific nature of the optic centre—we follow this change in its passage from the pigment to the rods and cones of Jacob's membrane, which it affects. These are in direct connection with the ganglionic nerve-cells, in which we suppose the nervous impression to be excited; this impression is thence transmitted, by means of the optic fibres, to the optic ganglion, and hence it becomes a sensation. Funke has a good illustration of this. 'The wave of light,' he says, 'can no more excite the optic nerve *directly*, than the pressure of a finger upon the air, or the walls of the organ-pipe can excite musical notes. The finger produces a tone by pressing on the keys: each particular key that is pressed brings forth a corresponding tone as the air enters the pipe.' In this illustration, the optic fibres are as the organ-pipes; the rods and cones of Jacob's membrane, as the keys; and the waves of light, as the air. But the most convincing argument against the retina as the receiving screen of images, and in favour of the pigmental layer, is, in my opinion, to be found in the eyes of the invertebrata. In the eye of the cephalopoda, this portion of the pigment has long been a puzzle; and Professor Owen says that it must doubtless be 'performed by the retinal papillæ; or otherwise a perception of light must take place in a manner incompatible with our knowledge of the ordinary mode in which the retina is affected by luminous rays.'

"In the crab's eye, the pigment layer covers the retina; in the blind crustacea, no pigment is present; and in albinos, in whom the pigment is deficient in colouring matter, the vision is very imperfect. In the nudibranchs, vision is simply the perception of light and darkness. The changes of temperature produced by the absorption of the rays in their pigment cannot be elevated into the perception of an image, because the optical conditions for the formation of an image are absent. An indefinite sensation, resulting from a change of temperature, is all that they can perceive. Nay, even were their eyes so constructed as to form optical images, there is little doubt that vision, in our human sense, would still fail them, owing to the

absence of the necessary combination of tactile sensations with sensations of light. We see very much by the aid of our fingers. If we remember that, according to the hypothesis, light only affects the retina after changing the temperature of the pigment, which change is communicated to the rods and cones, and thence to the vesicular layer, there will be nothing irreconcilable in the inverse arrangement of the retina in the invertebrata; in both, the process is essentially the same; and mere difference of position is not more than the difference of the chain of ganglia, which in the vertebrata is dorsal, and in the invertebrata is ventral."

Donders<sup>(1)</sup> makes no allusion to the importance of the pigment layer, when treating of the conditions of vision and of the function of the retina; he remarks:—"In order to see an object distinctly and accurately, two conditions must be fulfilled. In the first place, an inverted but well-defined image of the object must be formed on the surface of the membrana Jacobi, a layer of rods and bulbs of the retina. In the second place, the local change here excited, must be conveyed to the fibres of the optic nerve, communicated to the brain, and again, in an inverted direction, projected outwards. Through this double inversion, the projected image corresponds to the object, and we therefore say that we see the object, although, properly speaking, only the projected retinal image stands, as it were, before our eyes."

In his chapter on "Considerations connected with the mutual accommodation and adjustment of the Eyes," our author enters upon the difficult question of the agent or agents concerned in effecting the power of accommodation which the eye undoubtedly possesses. That the existence of this power should have been doubted by men like Halley and Majendie is a curious fact, but it is still more curious that, up to the present moment, the exact nature of the means by which the accommodative power of the eye is effected is a matter of doubt and of considerable difference of opinion. The various opinions entertained regarding the efficient agents of accommodation, may be grouped as follows:—Alterations in the curve of the cornea; changes in the pupillary opening of the iris; action of the ciliary muscle; changes in the curves of the lens; changes of position of the lens; action of the external muscles of the eye-ball; changes caused by a combination of two or more of the causes now enumerated.

(1) See his work on his *Anomalies of Accommodation and Refraction of the Eye*. New Sydenham Society, 1864. Introduction, page 1.

De la Hire and Treviranus looked upon the iris as the principal agent in this adjustment ; Dr. Young maintained that alterations in the form of the lens constituted the efficient cause ; Ramaden and Home thought the adjustment depended upon changes in the curve of the cornea ; Porterfield was in favor of changes in the position of the lens ; Rainey<sup>(1)</sup> thinks that accommodation depends upon the contraction and relaxation of the ciliary muscle, causing emptying and filling of the ciliary processes and consequent change in the position of the lens. According to this view, when the ciliary muscle contracts the ciliary processes are emptied, the lens advances, the pupil contracts and the eye is adjusted for its near point ; on the other hand when the eye is adjusted for its far point, the ciliary muscle relaxes, the ciliary processes are filled with blood, the lens is pushed back and the pupil dilates. From Dr. Wells' late experiments with the Calabar Bean on Mr. Bowman's eye<sup>(2)</sup>, we may gather that the accommodative power principally depends upon the action of the ciliary muscle.

The question of the importance of the iris in accommodation of the eye, has been set at rest most conclusively by Graefe's well known case<sup>(3)</sup> in which total dialysis of the iris was accomplished by that eminent oculist, and in which the power of accommodation of the injured eye remained unimpaired. Some, as Treviranus, have thought that the cornea underwent some change of convexity, but Helmholtz has disproved this by his ophthalmometer, and maintains that the adjustment is due to the ciliary muscle and iris and to changes in the curves of the lens. Arlt supposes that the adjusting power depends on the co-operation of the external muscles of the eye ball with the ciliary muscle, an opinion—as far as accommodation for near objects is concerned—disproved by the fact that complete paralysis of the recti and obliqui muscles may take place without affecting the power of accommodation ; Graefe, who advances this fact, admits, however, the influence of the external muscles in negative or remote adjustment of the eye. Others have contended (Cramer, Helmholtz) that the power of accommodation depends upon changes in the form of the lens, whilst at the

(1) Vide "Lancet," July 26, 1851.

(2) Vide Braithwaite's *Retrospect*, Vol. 48, page 195.

(3) Quoted by Dr. S. Wells, in his work on "Impaired Vision," page 14,



same time they have denied that any alteration of adjustment is due to change of position of that organ<sup>(1)</sup>. Dr. Wharton Jones makes adjustment to be dependent upon changes in the position and form of the lens. Henke advances the opinion that negative and positive accommodation are effected by the ciliary muscle, the circular fibres being contracted, and the radial extended in accommodation for near points, and vice versa, in accommodation for distant ones. So far his opinion seems to coincide with that of Rainey, Bowman, and Wells. Dr. Fleming lays great stress upon the action of the ciliary muscle and on the colligated action of the iris. Nunneley seems inclined to regard changes in the curve of the cornea, action of the external muscles, and generally, a combination of all the agents enumerated by authors as being required to accomplish the adjustments of the eye. Müller places great stress on the action of the ciliary muscle, and upon the sympathetic action of the iris, whilst at the same time he admits the fact of alterations in the curves of the lens. Finally, Donders of Utrecht, in his recent work published by the New Sydenham Society, page 10, states, that in accommodation the change of the dioptric system "consists in an alteration of form of the lens: above all, its anterior surface become more convex and approaches to the cornea." Sixty years ago, our countryman Young advanced this opinion, which, recently, has received support from the experiments of Cramer and Langenbeck. The principal agents in affecting the adjustment are the ciliary muscle and the lens. The ciliary muscle seems to control the states of fulness and emptiness of the erectile tissue of the ciliary processes, and so to cause the recession or advance of the lens. As to the means by which alterations in the curves of the lens take place, very discrepant opinions are held by medical philosophers. Subordinate agents of adjustment doubtless exist in the normal state, and we are far from excluding such as the action of the external muscles of the globe<sup>(2)</sup>, changes in

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(1) "Lieuwenhoek imagined that the form of the lens was changed by the muscularity of its containing capsule, while John Hunter, Dr. Young, and others asserted that the lens itself is muscular." Nunneley on the Organs of Vision, page 314.

(2) We are sensible of the effort made by the voluntary muscles of the eye, as well as by the ciliary muscle, when we force the eye to accommodate for an object held too close to it. Possibly the long axis of the globe may be increased by the pressure of the recti and obliqui.

the curves of the cornea<sup>(1)</sup>, and in the action of the pupillary margin of the iris.

We shall not enter upon a consideration of any of the questions bearing upon the classification of eyes into emmetropic or normal and ametropic or abnormal, the classification proposed by Donders of Utrecht. Our author's remarks on this important subject embody a brief and rather imperfect sketch of the labours of Donders and of Soelberg Wells the able English exponent of Donders' views. To the Utrecht philosopher we owe it that the scientific oculist can now, by a simple and accurate calculation, indicate the exact focal length of the lenses required by the myopic or presbyopic patient, instead of handing him over as heretofore to the rule of thumb expedients of ordinary vendors of these articles.

In speaking of the objective examination of the iris, our author makes a remark, having reference to the changes which take place in the size of the pupil during the inhalation of chloroform.

"As a practical point, and one of some interest, I would call attention to the changes which take place in the iris during the inhalation of chloroform. In the first stage, whilst the pulse rises, and the muscular system is excited to rigidity, the pupil contracts; as insensibility gradually becomes more profound, although the pulse then sinks and the muscles relax, the pupil still continues contracted, as in deep sleep, gradually dilating again as consciousness is restored."

The following passage also deserves attention:—

"The specific action of belladonna upon the iris, and the use made of it to dilate the pupil previously to an examination of the internal eye with the ophthalmoscope, require a few remarks from me; for, although the advantages to be derived are incontestable, the evils sometimes ensuing from its incautious employment should not be allowed to pass unnoticed. I have frequently seen a drop of a very weak solution of atropine produce, in the healthy eye, a very large amount of congestion in the capillary vessels, more than sufficient to deceive the practised eye of the surgeon, and which might well be mistaken for a diseased condition. For some time, therefore, my practice has been tending towards its discontinuance as a general application; and I have found that, in a vast number of cases,

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(1) The anatomical connections of the ciliary muscle show that its action may, to a limited extent, modify the curve of the cornea; contraction of the constrictor may increase the curve, and contraction of the radial fibres may diminish it. Both curve and circulation of the cornea must undergo alterations in states of anger, excitement and depression.

simply allowing patients to remain for a short time in a room somewhat duller than the light of the day, has been sufficient to cause all necessary dilatation of the pupil. Besides, it is well that practitioners should be aware that, to act, the atropine must be absorbed; and it then exerts a paralysing effect upon the nerves distributed to the iris, as well as on the ciliary muscle; and the consequence is, the power of accommodation remains seriously affected for several days, and patients are very apt to complain of the annoyance. If, also, the sight from this time should become worse, the great probability is, that the surgeon will be blamed, as having caused some aggravation of the disease.

"To account for the dilatation of the pupil by the action of the salts of belladonna, very many experimental investigations have been made to discover the particular nervous track of the specific effect produced. Accordingly, Dr. E. Waller, with Professor Budge, have made experiments which seem to prove that the nerve fibres of the cervical sympathetic which go to the iris originate from the spinal cord, between the sixth cervical and the fourth dorsal vertebra. And Dr. Brown Séquard has also ascertained that the origin of the fibres of the sympathetic going to the iris are still more extended. He has shown that section of the spinal cord, as high as the level of the fifth cervical, or as low as the ninth or tenth dorsal vertebra, allows the uncontrolled third cerebral nerve to contract the iris. In agreement with Biffi, Cramer, and Ruiter, Budge found that, after section of the sympathetic in the neck, and even after extirpation of the superior cervical ganglion, belladonna still exerts its dilating influence on the pupil, though in a less degree. Dr. Harley noticed that, after section of the sympathetic in the neck, by continuing the application of the atropia, the pupil becomes at last fully dilated.

"If belladonna acted merely by paralysing the sphincter, we could not have such a result as this; seeing that the dilator, already so completely paralysed by section of its nerve, would not be in a condition to act spontaneously on the cessation of the antagonism of the sphincter. The result, however, is consistent with the opinion that belladonna excites the dilator pupillæ, if we admit that the drug comes by absorption to act on that muscle. The result is also not inconsistent with the supposition that belladonna acts both by paralysing the sphincter and exciting the dilator. Budge has cut both the oculo-motor nerve and the sympathetic: nay, more—he has cut all the ciliary nerves, together with the optic; and still found the pupil to dilate distinctly under the influence of atropia. This result is entirely consistent with the opinion that belladonna acts both by paralysing the sphincter and exciting the dilator pupillæ.

"To reconcile conclusions so opposite, appears impossible. The natural inference is, that, in whatever way belladonna acts in dilat-

ing the pupil, it is not through a medium so indifferently affected by the most serious lesions as are, evidently, the motor communicants of the iris with the brain and spinal column. It seems to me far more analogical to surmise that it is the nerve of sensation itself which becomes partially paralysed by the absorption of the active principle of the belladonna, and, in consequence, is less sensible to the stimulus of light ; an effect of surrounding darkness is produced, and the then comparatively uninfluenced ciliary nerves of the iris dilate the pupil in accordance with their natural function. In the face of Budge's crucial experiment, where every motor and sensitive nerve connected with the economy of vision was divided, we must rather conclude that such is the case, or that the contraction of the muscular fibres of the iris is a power *per se*, to the proper exercise of which belladonna is specifically antagonistic.

“ Experiments in another direction have also proceeded on observations made of the presumed conflicting action of opium and belladonna ; but little more has been proved, in my opinion, than what was previously well known to the profession. The fact that opium and morphia produce contraction of the pupil has always been remarked as the ordinary symptom of their therapeutic operation upon the brain, producing spasmodic constriction of a muscular sphincter, and as if in immediate subjection to an over-sensitive retina, impatient of light ; the reverse, in fact, of the condition of the optic nerve when affected by belladonna. To some extent, the specific effect of this latter, mydriatic, might counteract the local symptom produced by opium, without, however, having the slightest influence upon the primary remote cause of irritation on the brain, and would be a very empirical proceeding. Strong coffee would have a much more legitimate effect. But truly, the investigation promises no practical benefit in ophthalmic disease ; and it is a question with me, whether the decided improvement in some forms of ophthalmia, due to the specific action of opium, reducing local spasm by diminishing the sensibility of the vessels affected, be not really analogous to that which influences the motions of the iris after the application of belladonna ? ”

Connected with this extract are some curious physiological and therapeutic speculations, which deserve further investigation. In speaking of the mobility of the iris and of nervous stimuli of motion, we must never forget that the nerves are to the contractile fibres, what the rider is to the horse. The contractile fibre possesses, *in itself*, contractile power ; the nervous stimulus, like the rider, sets that contractility in operation, and increases, regulates or controls it. The evidence of this, as regards the iris, is afforded by the fact that the pupil dilates under the action of belladonna, after all the nerves supplying the iris have been divided, thus proving a “ vis insita ” of

the muscular fibres of the organ. Another point to be borne in mind is, that the action of the circular and radial fibres of the iris, though antagonistic, are yet harmoniously antagonistic, for in every contraction and dilatation of the pupil there is a corresponding relaxation of one set of fibres and contraction of the other. In the dead eye, the pupil is in a medium state between dilatation and contraction, consequently the contracted and dilated pupils are states indicating the presence of muscular action. Under the stimulus of light and during sleep the pupil contracts; in darkness it dilates. A branch of the 3rd pair of nerves supplies the circular fibres of the pupil, and motor branches, supplied by the "cilio-spinal" region are supposed to convey the motific stimulus to the radial fibres of the iris. Sympathetic fibres, which are both *motific* and *calorific*, supply the minute arteries of the organ.

The pupillary circle being under the influence of the third pair, it follows, that any *excess* of nervous stimulus will induce more or less continuous contraction of the pupil and relaxation of the radial fibres of the iris, and that any *diminution* of the same nervous supply will result in dilatation of the pupil from the unopposed action of the radial fibres. The radial fibres again, are under the influence of the "cilio-spinal" nerves, hence any *excess* of nervous stimulus will induce dilatation of the pupil and contraction of the radial fibres, and any *diminution* in the amount of the nervous power will eventuate in contraction of the pupil from the unopposed action of the 3rd pair and of the circular fibres. Again, the blood-vessels of the iris are supplied by sympathetic nerve filaments, which are both motific and calorific, hence any *excess* of nervous energy will cause contraction of the vessels, congestion of the venous radicles, diminution of caloric and secondary contraction of the muscular radial fibres of the iris; the pupil becoming dilated;<sup>(1)</sup> on the other hand, a *diminution* of the same nervous stimulus will cause dilatation of the small arteries, increase of heat, and contraction of the circular fibres of the pupil, the action of the radial fibres being impeded in consequence of the arterial congestion<sup>(2)</sup>. In this latter case there will probably be hyperæsthesia. Dr. Laycock, in his paper on Protrusion of the Eyeballs,<sup>(3)</sup> gives

(1) This illustrates the theory of the action of Belladonna.

(2) This illustrates the probable action of the Calabar Bean.

(3) *Edinburgh Medical and Surgical Journal*, No. 92, February, 1863.

some interesting historical details, bearing upon the nervous supply of the iris, which we may reproduce here in abstract. Purfour du Petit in 1727 shewed the influence of injury of the cervical portion of the sympathetic on the eye; he observed contraction of the pupil, retraction of the globe, and redness of the conjunctiva to result. In 1845, Biffi of Milan shewed that when the pupil was contracted owing to division of the cervical sympathetic, it became dilated if the upper end of the nerve was galvanized. In 1852, Claude Bernard ascertained that when the cervical sympathetic was divided, there resulted contraction of the pupil, a narrowing of the palpebral fissure, retraction of the eye-ball, flattening of the cornea, hyperæsthesia of the surface, congestion of the vessels, pulsation of the smaller arteries and great increase of temperature on the side of the head operated on, which increase of temperature existed not only externally but also within the cranium. When, however, the upper end of the nerve was galvanized, these conditions were reversed, and there resulted diminished heat and vascularity, dilatation of the pupil, enlargement of the palpebral fissure and protrusion of the globe. Dr. Waller and Professor Budge discovered that if they galvanized that portion of the spinal chord of a rabbit which extends between the 1st cervical and 6th dorsal vertebræ, there ensued dilatation of the pupil, and they called this region of the spinal chord the "*cilio-spinal*." Bernard has shewn a connection between the anterior roots of the two first pairs of dorsal nerves and the muscular mechanism of the eye. If these are divided on one side, without injuring the spinal chord or the sympathetic in the thorax, the eye of that side is affected, the pupil contracts, the opening of the eye-lids narrows and the eye-ball is retracted, but no increased sensibility of surface is induced, nor increased heat or vascular activity. When the peripheral ends of the divided nerves are galvanized, the same results follow as when the upper end of the cervical sympathetic is galvanized, hence in the dog—the animal experimented on—the motor nerves of the eye decussate and originate in the dorsal region of the spinal chord.

It seems therefore to be proved—1, that the circular fibres of the sphincter pupillæ are under the control of the third pair; 2, that the radial fibres of the iris are under the control of the cilio-spinal nerves; and 3, that the contractility of the circular fibres of the small arteries of the iris (with

the production of caloric) is under the control of the sympathetic nerves.

Many toxicological agents exert a specific action on the muscular arrangements of the eye, and it has long been a matter of speculation, in what way, for example, Belladonna causes dilatation of the pupil. It has been said that it acts by paralysing the branch of the third nerve which supplies the sphincter pupillæ, but has this been proved or has it been only taken for granted? The pupil may dilate, *first*, from paralysis of the third pair; *secondly*, from excessive nervous stimulus of the cilio-spinal nerves; *thirdly*, from excessive stimulus conveyed by the sympathetic nerves, or *fourthly*, from the direct action of the poison upon the arterial branches of the iris, inducing contraction of their circular fibres and secondary contraction of the radial fibres of the iris. Now, from the proved fact that, after all the nerves supplying the iris have been divided the instillation of atropine will cause the full dilatation of the pupil (Harley), we gather, that Belladonna does not act by paralysing action but by exciting action. This valuable fact was first, we think, announced by Dr. Wharton Jones, and has more recently been illustrated and confirmed by Dr. A. Fleming<sup>(1)</sup>. Applied to the mucous membrane, atropine dries it; applied to smaller arteries, it constricts them; applied to the conjunctiva, it contracts the small vessels of the iris, relaxes the proper tissue of the organ, and either stimulates to contraction or permits the contraction of the iridal radial fibres; it further, as we know, acts upon the ciliary processes, relaxes the erectile tissue (Fleming), calls into action the radial fibres of the ciliary muscle, and induces distant vision by suspending the muscular accommodation of the eye, and so permitting the recession of the lens.

Investigations of this kind are not mere matters of curiosity. Dr. Wharton Jones points out that glaucoma consists essentially of a venous congestion of the choroid and retina; along with which congestion is observed constriction of the minute arteries. This is the pathological state induced by the action of atropine. There is no remedy so injurious to glaucoma as atropine; it often extinguishes permanently

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(1) Vide Dr. Fleming's paper in Braithwaite's Retrospect, Vol. 48, page 363, and Dr. Wharton Jones' lectures on Glaucoma and Iridectomy—*Medical Times*, July 1864.

the last faint glimmerings of vision. In this instance, at least, the axiom "*similia similibus curantur*" is found not to apply.

The whole subject on which we have briefly touched is an interesting one, and well merits further investigation. The day may come when, in the action of toxicological agents upon the iris and ciliary body, as revealed by their effects upon the pupil and on the accommodation of the eye, we may possess a measure of the degree of influence upon the general system which these agents have effected. The accurate observation and explanation of the action of mydriatics and myotics will yet lead to important results in physiology, medicine and therapeutics.

We must pass over the consideration of the ophthalmoscopic appearances of healthy structures, only remarking that the tableau of the fundus oculi of the native differs very considerably from that of the European, owing principally to the greater amount of pigment, not only in the pigment layer but also in the choroidal stroma of the native eye<sup>(1)</sup>.

The more practical part of the book under review begins with the fifth chapter. The first point which strikes a practical oculist is the varied and very diverse circumstances under which the operation for the division of the ciliary muscle has been performed by the author, and for which it is recommended as the appropriate treatment. Intra-ocular myotomy has been performed in keratitis combined with cyclitis,<sup>(2)</sup> characterized by intense pain and photophobia; in keratitis with irido-cyclitis; in conical cornea; in leucoma; in staphyloma corneæ; in staphyloma scleroticæ; in retinitis with tension of the globe; in apoplexy of the retina; in apoplexy of the retina combined with albuminuria, accompanied with intra-ocular pressure; in anemia of the retina; in acute and chronic glaucoma; in the earlier stages of irido-choroiditis; in chronic choroiditis combined with hydrophthalmia, and finally in sclerectasia posterior, or posterior staphyloma.

The rationale of this simple operation is the relief of intra-ocular tension by the division of the coats of the eye and of the circular fibres of the ciliary muscle. Though

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(1) Vide remarks on the ophthalmoscopic appearances of the Fundus Oculi in the Natives of Southern India, by Dr. George Smith. *Madras Quarterly Journal*, No. 15, February 1864, p. 74.

(2) *Cyclitis* is the new name for inflammation of the ciliary body.



paracentesis of the eye both by corneal and sclerotic puncture has been known to oculists for many years, yet it is to Mr. Hancock we are indebted for the suggestion of *division of the ciliary muscle*.

Owing to the peculiar shape and structure of the ball of the eye, enclosed as it is in a dense white inelastic capsule, no morbid state equals in destructive effect that of tension. This fact is well seen in acute glaucoma, in which, from the engorgement of the retinal and choroidal venous systems and from effusion into the vitreous humour, sight is totally lost after a few hours of agony, during which the eye-ball becomes hard as a stone from intra-ocular tension.

Division of the ciliary muscle as proposed by Hancock, or the more severe operation of iridectomy as proposed by Graefe, if early performed, diminishes at once the tension, and saves from total destruction the delicate functions of the retina.

In England, the rival operations have each their zealous supporters. In this country, we have found, that the native eye does not stand the operation of iridectomy well, though it recovers from the less severe operation of division of the ciliary muscle with the greatest possible facility. We have repeatedly, and for various morbid conditions, performed Hancock's operation on the native eye, and in some cases have performed the operation more than once on the same eye, without any injurious effect upon the organ *quoad* the operation, and with the most marked results in cases where the tension of the globe was above the normal standard.

The mode of performing the operation is thus described by Mr. Hogg:—

"The only instrument required is an ordinary Wenzel's knife, which is introduced about the tenth of an inch from the outer margin of the cornea, where it joins the sclerotica. An incision obliquely backwards and downwards is then made of little more than one-eighth of an inch in extent, and dividing the various structures represented by the dotted line in Fig. 17 the ciliary muscle is cut through, and, what I think most important of all, the triangular canal of Schlemm. It is not necessary to the success of the operation that either the aqueous or vitreous humours should be invaded, although sometimes an escape of fluid by the side of knife indicates this to have been the case. The essential object is to divide the immediate cause of the most threatening symptoms, which is the band of constricting tissue."

As Wenzel's knife may not be within the reach of many of our Indian medical friends, who may yet have to treat that most common disease in India glaucoma, we may be excused if we mention briefly the mode of operation generally adopted by us. We take a Beer's knife, and with an ink trace we mark the exact spot where the diameter of the blade is one-eighth of an inch wide. Separating the eyelids with the wire speculum—the patient being recumbent—we steady the eye by laying hold with the forceps of the conjunctiva, on the nasal side of the cornea, midway between the base of the cornea and plica semilunaris, and then, at the distance of 1-10th of an inch from the corneal margin on the temporal side of the cornea and below the equator of the eye, we pass the point of the Beer's knife—back of the blade to the cornea—in the direction of the centre of the vitreous humour, steadily onward, until the ink line disappears in the sclerotic wound; by this operation the ciliary muscle is divided. The operation is a simple one, rapidly and easily performed, and is attended with very little pain.

Mr. Hogg still retains, we observe, the needless three-fold division of corneal opacities into nebula, albugo and leucoma, instead of regarding albugo as the Latin equivalent of the Greek term leucoma<sup>(1)</sup>.

In referring to the fact that keratitis often results from direct injury of the cornea, our author remarks:—

“Direct injury too will frequently bring on *keratitis*, and it is one of the evils which sometimes arise, to interfere with the success of an operation for cataract. It is true, that in a healthy system there is little to fear; but still I could not acquit myself of proper care to those I am advising, did I not seek to impress the importance of avoiding, whenever possible, any application of the operating knife to the structure of the cornea.”

In the case of natives of India, keratitis is observed both after extraction and after needle operations. After extractions, it is no uncommon thing to have a more or less severe attack of inflammation of the edges of the section, which inflammation, in unfavorable cases, eventuates in purulent infiltration of the cornea; in the majority of cases, however, inflammation of the cornea either does not occur at all, or

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(1) Mr. Dixon, in his admirable “Guide to the practical study of diseases of the Eye,” 2nd Edition, page 87, observes, “a forced distinction has sometimes been drawn between the two latter terms, but their etymology shews them to be perfectly synonymous.” (λευκος = albus.)

only to a manageable extent. It was no doubt, in part, the fear of this complication occurring after such an injury to the feeble corneal structure of the native, which prevented former oculists in India from having recourse to the operation of extraction. Now-a-days the danger, though not overlooked, does not deter the operator from extraction, for experience has taught him, that, in the majority of cases, the corneal section readily unites, and that in the remainder, stimulants and good food will do much to check an inflammation whose tendency is towards death of tissue. In our experience of the treatment of inflammation in the native constitution, we can heartily endorse the wise saying of Dr. Chambers,<sup>(1)</sup> "disease is in all cases not a *positive existence*, but a *negation*; not a new excess of action, but a *deficiency*; not a *manifestation of life*, but partial death; and therefore that the business of the physician is, directly or indirectly, not to take away material, but to *add*; not to diminish function, but to give it play; not to weaken life, but to *renew life*."

From the chapter on cataract we extract a passage of considerable interest:—

"For some years past the attention of the profession has been directed to the frequent association of cataract with several forms of general disease existing in the system; and this has given rise to investigations which fortunately has been attended with results of a very satisfactory character. In previous editions, I have mentioned that Mr. Jordan had satisfactorily shown that cataract is intimately connected with heart disease; and every one must admit the soundness of his general view: 'That there should be an intimate connection between cardiac and ophthalmic disease cannot, *a priori*, be deemed improbable to any one prepared to admit the connection between diseases of the heart and diseases of the brain. Shall the central artery of the retina maintain its integrity amid the ravages of a disease which does not leave the divisions of the internal carotid itself competent to the performances of their duty? The purely mechanical protrusion of the eye attending a hypertropic heart is a condition now commonly appreciated. But there are other and more delicate conditions of the visual organ, telling of cardiac states so palpably that they shall challenge the credence of the accomplished physician and surgeon.'

"My own observation has previously assured me that cataract is very often associated with ill-feeding, or an impoverished state of the blood. An anæmic condition of the retinal vessels is almost

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(1) Vide "Medical Times," November, 1861.

always present in the early stage of the disease ; the fact induced me to push blood tonics, believing that, by improving the blood, and by attending to the general health, I might perhaps arrest the formation of cataract. The treatment I consider to have been very successful, as in many cases I have noticed opacities remaining stationary for four years and upwards ; during the greater portion of which time the patients were under my own observation."

"Another serious and not uncommon complication of cataract is associated with *diabetes mellitus*. A French oculist, indeed, goes so far as to declare that he has on more than one occasion, diagnosed the existence of *glycosuria* from the peculiar anatomical character of the cataract. It is generally of the soft variety, large and full, frequently pressing forward the iris against the cornea, so as to fill the whole of the anterior chamber. The development of this kind of cataract is likewise very rapid. The practical importance of detecting this complication, when present, as stated by M. Follin (of the Necker Hospital), depends upon the difficulty of procuring adhesion of the corneal flap in extraction, and in the danger of inflammation and irido-choroiditis if depression is the course adopted. It is therefore highly necessary, before proceeding to an operation, to learn the state of the urine, as the total want of reparative power which characterises *glycosuria* affords very little prospect of success if its presence be detected. Where circumstances, however, do authorise an operation, as extreme desire on the part of the patient, as M. Pollin has properly pointed out, the after-treatment must be very different from that in ordinary cases, and consist of the most nutritious food and the generous use of wines."

"In a paper, published in the American Journal of Science for January 1860, Dr. Mitchell asserts, that—

“‘Cataract may be produced artificially by overcharging the blood of an animal with sugar.’ The fact has been established by other experimenters ; and it is considered to be purely *osmotic* : that is to say, due to an excessive transudation of water from the lens to the surrounding fluids, upon which the component parts of the lens are disarranged, and opacity is the result. This form of cataract connects itself intimately with what has been made out in the etiology of the disease, as to the co-existence of diabetes and cataract.”

“Dr. Richardson has more recently confirmed the experiments made by Dr. Mitchell, and arrives at the following conclusions:—1. ‘In addition to the sugar-cataract, there is producible what may be called a saline cataract. 2. The appearances of the cataracts, as produced by different solutions, vary ; thus the cataract, artificially produced by chloride of sodium, differs from that produced by grape-sugar. 3. The cataractous appearance is modified by the density of the producing body, and is removable by reversing the conditions which have led to it ; and as it is producible in a clear

lens removed from a body, it is a demonstration that the cataract induced in different animals is a purely physical, osmotic change."

The great frequency of cataract among the poorer classes of natives, and its appearance at a comparatively early period of life, bear out the views of the above extract, that cataract is often associated with poor diet and with an impoverished state of the blood. In India, we see both in military and civil life, the effect of insufficient nourishment upon the constitution of the native; in early youth these effects are not prominently manifested to the observer, but at a period when the well-fed man is still in his prime, the native, whose means have been inadequate to secure sufficient nourishment, presents all the appearance of an old and worn-out man, with grey hair, opaque lenses, arcus senilis, stiff joints, and tendency to *pthisis senum*. These changes of degeneration are, no doubt, postponed by good diet, and it is possible that the incipient cataractous changes may be arrested by removing those conditions of malnutrition, upon which their existence and progress in no slight degree depend. It is, however, to be remembered, that the fact of opacities becoming stationary is no evidence that the remedial measures employed have been the agents by which the arrest was secured. In some cases cataracts form with great rapidity, in other cases, and without any obvious reason, the opacity increases with great slowness. Though the tendency of the cataractous change is to increase and finally pervade the whole lens, still this change may be arrested at any point or, again, it may progress so slowly, that after many years the impairment of vision is found to have increased but very little. We know of a case of cataract, in which the slightly impaired vision of 20 years ago, due to incipient opacity of the lenses, remains almost unchanged; the cataractous degeneration having either altogether ceased, or taking place so slowly, that its results to vision are almost imperceptible.

The complication of cataract with diabetes mellitus, sufficiently common in England, is very rare in this Presidency. During the last year we have met but with one case, which occurred in an European, and in him the peculiar anatomical structure of the cataract generally accompanying glycosuria, did not present itself. Instead of being a soft cataract "large and full, frequently pressing forward the iris against the cornea, so as to fill the whole of the anterior chamber," and of rapid growth, it proved to be a cataract of slow deve-

lopment, and of the kind called Morgagnian, consisting of a large, hard, amber nucleus lying loose in a capsule filled with milky fluid.

The chapter on Diseases of the Retina, we regard as one of the best in the book. The importance of the study of these diseases cannot be over-estimated. Threatening apoplexy may show on the retinal surface its earliest indications; albuminuria, diabetes, and syphilis may be diagnosed from their special manifestations on the fundus oculi, and often has it happened that the attention of the medical practitioner has been, for the first time, directed to the state of his patient's general system, in consequence of the revelations made by the ophthalmoscope. In fact, the ophthalmoscope, by substituting certainty for doubt, has rendered almost valueless the opinions of the older oculists as regards diseases of the retina in those cases in which their opinions have not been corroborated by subsequent pathological examinations.

We extract a few passages having a practical bearing :—

“ The second variety of hyperæmia is most commonly met with in adult age, where the system has become debilitated by long continued abuse of tobacco and alcoholic stimulants, and illustrates how naturally the fundus of the eye assumes conditions indicative of the general state of the body. The patients present the usual symptoms of incipient cerebral disorganization, in the tremulous movements of their tongue and general appearance. Here, on examination, will be found congestion much more considerable, extending over the retinal field, and concealing in a great measure the papilla by a uniform deep red hue. When the optic nerve entrance is thus undistinguishable from the rest of the fundus, the course of the vessels which are still visible enables its situation to be made out.”

Speaking of insensibility of the retina due to syphilitic poison, our author remarks :—

“ It is now ascertained, with the ophthalmoscope, that where a defect of vision has accompanied or supervenes a syphilitic attack, the retina presents an unusually pale anæmic appearance, with irregular patches of exudation, fixed or loose flocculi, in the retina or vitreous. Frequently there is great intolerance of light, and a sense of heaviness and pain in the globe of the eye. The retinal circulation shows evidence of considerable disturbance, as the vessels are observed frequently to be very unequally dilated. The most interesting cases of this class indicate serious complications in the cerebral, or spinal system, paralysis in various forms, especially

paraplegia, being present; and it is inferred that pressure, due to some abnormal condition connected with the disease, is the principal cause. There is a case on record of paraplegia originating in constitutional syphilis, where a gelatinous tumour was found pressing upon the spinal cord. The pain that frequently accompanies attacks of this kind affords some indication of its exciting cause, as it comes on rather late at night, as from 11 P. M. to 2 A. M. Rheumatic pains come on earlier in the evening, and neuralgic usually occur in the morning. In this circumstance an important aid to diagnosis is obtained, which will assist in distinguishing between syphilitic and other forms of retinal disease."

The following interesting remarks, founded on the observations of Dr. Liebreich on the disease called "*Retinitis pigmentosa*," deserve to be recorded here:—

"Continental surgeons have recently directed attention to many very curious facts connected with a congenital disposition to a form of *retinitis pigmentosa*; the importance of which, as affecting the happiness of families, is so great, and so necessary to be known as interesting society generally, that I feel it imperative to introduce here some remarks of Liebreich's upon the subject, accompanied with valuable statistical details of one of the many evils that are apt to result from intermarriage with near relations.

When children are observed to see very imperfectly about twilight; and that the field of vision generally seems limited, it may safely be presumed that *retinitis pigmentosa* of the form I am speaking of is present. The disease advances with age, so that about the thirtieth or fortieth year complete blindness ensues, previously to which fine print was legible in certain parts of the field of vision where the retina still continued sound. The ophthalmoscope shows extensive changes have taken place, especially in the appearances of the choroid and optic nerve entrance. Around the latter, a number of intensely black spots, frequently star-shaped, are sometimes observed. In other cases, a more decided reticulated arrangement spreads a thick network over the parts. Exudations also take place, on the retina, which becomes more and more atrophied with increasing years. In a patient affected with this disease, Dr. Liebreich, learning that the parents were cousins, instituted an examination, among other cases of a similar nature under his care, and found that more than one-half were children of relations in very close degrees of consanguinity. He extended his inquiry to discover whether *retinitis pigmentosa* was generally associated with the diseases well-known frequently to follow, as congenital among the issue of close marriages among relations, such as cretinism, idiotism, deafness, and dumbness. M. Maffei, a French surgeon, had previously remarked, that among cretins it was a noticeable symptom, that they did not seem to perceive small objects, although the eyes appeared perfectly healthy;

and he ascribed it to their constitutional apathy and indifference, and to not being accustomed to occupy the eye with small objects. Dr. Liebreich, however, by ophthalmoscopic examinations, has shown that this limitation of vision in cretins is due to changes in the condition of the retina. In fifty idiots he examined, he found three suffering from *retinitis pigmentosa*; but among these the parentage of only one could be ascertained. He was of noble descent, and his parents cousins. Marriages between near relations in this family had occurred for many generations, and its history as regards the physical condition of the offspring is both useful and instructive. The grandfather of the idiot just mentioned was married to a stranger, and had three healthy children. Of these, the eldest son was also married to a stranger, while the two daughters, one after the other, married the same cousin. The eldest son has had eleven healthy children, of whom nine are alive, and part of them married, and have also begotten healthy children. Only one of these married a cousin, and he has one idiotic child and six healthy ones. Of the two daughters just mentioned, the elder, who married her cousin, died while giving birth to her first child, which was still-born. Her husband then married the deceased wife's sister, and had by her thirteen children. Of these, two died in the first year; the third died somewhat later, from dysentery; a fourth, who was completely paralysed, lived to the age of sixteen; a fifth and sixth are quite blind; and, according to the description given, most probably in consequence of *retinitis pigmentosa*. The seventh, whom Dr. Liebreich has examined, is idiotic and affected with *retinitis pigmentosa*. The other six children were healthy; one of them is married to a stranger and has no children; another is married to a cousin, and has one idiot child among seven. A third, who married a cousin, has only one feeble child; the other three healthy ones are unmarried.

Of 34 deaf and dumb persons in Berlin, examined by Dr. Liebreich, fourteen were affected with *retinitis pigmentosa*; and among these there were no less than eight Jews, whose affliction may be ascribed to the frequency of marriages of consanguinity. Among them was a family of five children, sisters and brothers, whose history is also remarkable. The father is a healthy soldier, but given to hard drinking. He married the elder of two sisters, by whom he had six children, three of which were deaf and dumb. By a subsequent marriage with the younger sister of his wife he had a son, who was also deaf and dumb. All the children suffered from *retinitis pigmentosa*; and Dr. Liebreich has always found that, if deafness and dumbness and *retinitis pigmentosa* are prevalent in a family, the children who suffer from one are also affected with the other; and that those who are free from the one, are free from the other. Of 35 other cases of *retinitis pigmentosa* examined by Dr. Liebreich, fourteen were the offspring of marriages of con-



sanguinity. Gräfe has since observed, in eleven cases out of twenty-five of retinitis pigmentosa under his care, that the circumstances were such as confirmed the statements of Dr. Liebreich."

Of the diseases of the choroid, no one deserves more attention than glaucoma. The exact pathology and seat of this serious affection of the eye has long been a matter of doubt. It has been spoken of as a choroiditis or irido-choroiditis, as a cyclitis or inflammation of the ciliary muscle, as a more or less acute congestion of the choroidal system, as a congestion of the retina as well as of the choroid<sup>(1)</sup>.

The mode of invasion of this very serious disease is thus described by our author:—

"An indistinct obscurity cognizable in the deep-seated humour of the eye, and a greenish reflection from the fundus, occurring generally in persons of mature age, prepare us to suspect the presence of glaucoma. The sluggish dilated pupil is somewhat altered in colour. A hardness and tension of the globe is also always observed—due, there can be no doubt, to an increase in the contained fluids. The sclerotic has a peculiar pale-bluish hue. The premonitory symptoms, which may appear suddenly, but more generally, are spread over weeks or months, are sometimes so slight as to excite little attention, until some progress has been made by the disease. Occasional dimness of sight is complained of, and any existing presbyopia is increased. Pain in the eye-ball—iridescent halos appear to surround the light of a candle—sometimes accompanied with severe headaches, are apt to occur towards evening. Accessions, at first perhaps separated by long intervals, now return more frequently, the dimness is permanent, and the case, with the occasional remissions, may be said to have become chronic. Examined with the ophthalmoscope, the cupping of the optic nerve entrance is very characteristic. It is readily distinguishable by the abrupt suddenness of the depression, and by a peculiar lateral extension, from the shallow and more saucer-like form of the same kind of appearance present in functional or cerebral affections of the retina and optic nerve. The pulsation of the central vessels is also an important diagnostic appearance, as it is to some extent a measure of the inter-ocular mischief caused by the pressure of the increased fluids in the globe. Sometimes hæmorrhagic extravasations are visible, both in the retina and vitreous humour.

It is observable that the excavation of the optic nerve progresses gradually with the increasing tension of the globe. This part it would seem offers less resistance than any other where it is supported by

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(1) Mr. Hogg looks upon glaucoma as an inflammation of the ciliary muscle; Dr. Wharton Jones regards the disease as a venous congestion of the choroid and retina. (See *Medical Times*, July 1864.)

the unyielding texture of the sclerotic coat : and an atrophied condition of the nervous fibres in this situation follows upon the excessive pressure to which they are exposed.

There is another form of glaucoma, differing remarkably from this subacute development of the disease, very generally ushered in without any distinct inflammatory stage, and presenting but few of the usual premonitory symptoms. Instead of proceeding gradually, it appears to accumulate suddenly in intensity, and so violent sometimes is the attack, that vision is lost as if by a stroke. It comes on usually at night, with intolerable headache, especially in the forehead and orbital region in general. The pupil is widely dilated, immovable, the whole globe very hot, and the seat of unusual tension, with every appearance of an internal ophthalmia. The iris has a dull greyish or greenish hue, and presses forward ; the posterior surface of the cornea being also duller, and evidently affected by the prevailing excitement. After a few hours of intense suffering, which often I have seen abate almost as suddenly as it commenced, vision, in part returns, and the paroxysm seems at an end. In some cases, the blindness continues from the first, leaving an idea in the patient's mind that the calamity proceeded from a violent nervous or bilious headache. These inflammatory paroxysms recur at irregular intervals, more or less protracted, each time seriously diminishing the power of vision ; the symptoms, at first transitory, become confirmed, and the disease ends in total blindness."

Our author omits all mention of the characteristic haziness of the cornea in glaucoma, a haziness as if that polished surface had been breathed upon, the result no doubt of intra-ocular pressure. His remark, that the disease occurs most frequently in mature age, quite coincides with our experience in India. Persons upwards of 40 years of age, of feeble constitution, of limited or lately ruined means, and especially those who have been suffering from mental anxiety and distress, in whom headaches have been common, and whose general health is out of order, women on the cessation of the catamenial period, who are suffering from disordered health and mental despondency are the sort of patients which usually present themselves as the subjects of glaucoma. That it may occur in younger persons, under very different circumstances from those just enumerated, we are aware. We have known this sudden and serious congestion of the retinal and choroidal system to occur in a healthy man under 30 years of age as the result of severe sea sickness, a fact which seems to corroborate the view, that the essence of the disease consists in a congestion, princi-

pally of the choroidal system accompanied with effusion and consequent tension of the globe. Perhaps we are right, however, in regarding the term glaucoma as a compound term like "dysentery" or "fever," and as containing within it different pathological states. We are inclined to look to the cerebral or visceral circulations deranged by conditions of the general health, as the proximate cause of the choroidal congestion of glaucoma, and to regard local inflammatory action of the choroid, of the iris, or of the ciliary muscle, as occasional but not necessary elements of the disease. Sudden congestions of organs we see as the result of malarial influences which are or are not associated, according to circumstances, with inflammatory actions and exudations. Whether in India there is any connection between glaucoma and malaria as one of its causes, we cannot say, but our opinion has lately been that the connection is far from being at times an unlikely one.

Our author alludes to severe headaches as concomitants and precursors of acute glaucoma, but he omits to mention another evidence of cerebral complication, namely, the severe vomiting which frequently attends the invasion of the acuter forms of the disease.

In his sketch of the symptoms of glaucoma sufficient stress has not been laid upon the fact that the rapid increase of presbyopia is, according to von Graefe, one of the most marked premonitory symptoms of the disease; the result it is supposed of increased intra-ocular pressure and flattening of the cornea.<sup>(1)</sup>

The extreme tension of which the globe is the subject, in this formidable disease, is owing, in part to congestion of the choroid and of the ciliary processes, in part to various effusions into or upon the retina, to fibrinous infiltrations into the ciliary muscle, and to serous transudation into the aqueous and vitreous humours. In the more sudden invasions of the disease, such, for example, as are described by Graefe under the name of "glaucoma fulminans," the disease appears to affect more the character of a choroiditis or irido-choroiditis "with diffuse imbibition of the vitreous body and aqueous humour," whereas in the more chronic and intermittent forms, the inflammatory symptoms are less distinctly marked, and the symptoms of congestion become more apparent.

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(1) Wells on "Impaired Vision," page 80.

Excruciating pain, which is a well marked symptom of the acuter forms of glaucoma, arises, no doubt, from the pressure upon the ciliary nerves dependent on the tension of the globe. These nerves present in great number in the ciliary muscle are compressed between the unyielding sclerotic and the distended erectile tissue of the ciliary processes, and the result is ciliary neuroses of the most severe kind, with constriction of the eye-ball at the point where the circular fibres of the ciliary muscle are present.

Mr. Hogg is inclined to regard glaucoma as "primarily an inflammatory condition of the ciliary muscle; not unlike a form of rheumatism which affects more particularly the fibrous texture of hollow muscles." Although this view has partly received the countenance and support of Dr. Philz, who calls the disease inflammation of the tensor choroideæ, yet we must take the liberty of doubting the accuracy of this view of the pathological nature of the disease. In this country, where glaucoma is very common as well as rheumatism, no connection between the two as cause and effect can be observed. By considering the disease as essentially a venous congestion of the choroid and retina, we can explain satisfactorily the objective as well as subjective symptoms of glaucoma. A quotation from von Graefe must close our remarks upon this interesting disease :—

"It proves that there are inflammations of the choroid of a very different kind. Diseases occur in this tissue, which are characterized by great circulatory and textural changes; the aqueous humour at the same time is not much altered; whilst there are others of which the opacity of the aqueous humour is pathognomonic. The general appearance of the so-called iritis-serosa, or hydromeningitis, was well described by the older authors; that their account now requires alteration is only owing to the advance of anatomical knowledge. Such an inflammation may continue for a long time without the occurrence of distinct changes of texture, adhesions, &c.; at all events, the chief symptoms continue to be diffuse cloudiness, and increased amount of the aqueous humour, probably with increased pressure in the anterior chamber. I hold a similar view of glaucomatous choroiditis that it is a disease of secretion. Serous iritis is also nosologically allied to chronic glaucoma. We not unfrequently find transitions of the former into the latter, and we find, *mutatis mutandis*, this fact also pointed out by older writers. The treatment of both affections is also analogous, with the difference that in iritis-serosa iridectomy is a last resource, recovery being often obtained by other means. In short, I consider *acute glaucoma* to be a choroiditis or irido-choroiditis) with diffuse imbibition

tion of the vitreous body and aqueous humour; and in which, increase of the intra-ocular pressure, compression of the retina, and the well-known series of secondary symptoms, are produced by the increased volume of the vitreous humour."

We believe that we have given our readers a fair though somewhat lengthy review of the contents of this work of Mr. Hogg, sufficient at least to enable those interested in the subject of ophthalmic disease to form their own views of its practical character and value. The work is neither an original nor a specially able one, but is useful as a fair resume of our present knowledge of those diseased conditions of the eye which may best be elucidated by the ophthalmoscope. Mr. Hogg is very largely indebted for his information to the writings of the German school, which school has done and is doing so much for medical science; to those who can consult the original matter, Mr. Hogg's book must be nearly a superfluity: to those who cannot, the work under review will prove valuable as a condensed manual of the present state of ophthalmoscopic surgery.

*Practical Observations on the Hygiene of the Army in India: including remarks on the Ventilation and Conservancy of Indian Prisons; with a Chapter on Prison management.* By STEWART CLARK, M. R. C. S., Eng., Inspector-General of Prisons, North-West Provinces, India. London: SMITH, ELDER AND Co., 1864, 8vo., pp. 162.

MR. CLARK has put in an opportune appearance just as the initiative has been taken in attempting to improve the sanitary condition of the British Army in India. The importance of the subject cannot be over-rated; and all who are interested therein,—and who can be indifferent so long as the existence of *preventible disease* is an acknowledged fact?—must gratefully receive and carefully weigh any observations which are of a thoroughly practical nature.

For many years past, great and good men, both in and out of the Medical profession, have been accumulating abundance of evidence that human life is being largely sacrificed unnecessarily; that, independent of inevitable mortality, a vast amount of sickness and death results from causes which ought not to exist. These causes have been carefully studied and are now tolerably well known, and they may be reduced to two heads: impure air, and impure or insufficient food—using

the word "food" in its proper sense as including all substances, whether solid or liquid, which are taken into the body as nutrients. Viewed in this light, it would at first appear that the matter lies in a nutshell ; but what a vast inquiry is opened out by the mere words "impure air !" The nature, source, and actual effects of every individual impurity have to be considered,\* and as Mr. Clark says :—

"With regard to impurities in the atmosphere, our information is, unfortunately, very limited ; and, beyond the fact that impure air contains a large increase in volume of carbonic acid, with, under certain conditions, a proportional decrease of oxygen, traces of carburetted hydrogen, sulphuretted hydrogen, sulphurous acid, phosphoretted hydrogen, and carbonic oxyde, very little is known of their nature."

The subject of food, too, opens a large question ; but we have no intention of entering upon these matters here ; our purpose is to show the manner in which Mr. Clark deals with them, rather than to offer any views of our own.

Mr. Clark divides his book into twelve chapters. The first chapter is headed *Air and Ventilation*, and, after a few introductory remarks, animal exhalations and their effects upon health are considered. Speaking of the baneful effects of highly putrescible animal matters, our author remarks :—

"We see that wounds, be they ever so slight, received in dissecting the dead human body, produce most serious consequences through the introduction into the system of a very minute quantity of some very virulent poison, generated during the first stage of decomposition ; and supposing that the organic matter given off by the living body partakes of the nature of this poison, immediately when decomposition begins, (and there is nothing impossible in this, seeing that in both cases we have to deal with human organic matters in the first stage of putrefaction), we shall only be surprised that the mischief arising from such a poison being brought into contact with the blood, as it circulates through the lungs, has not a more rapidly fatal result.

"This is an extreme view of the case."

This is, indeed, an extreme view of the case. We cannot see the exact analogy between the actual introduction of a poison into the system by *inoculation* and the probable introduction of a similar poison (granting the similarity, though we should be inclined to doubt the identity) by means of the respiratory apparatus, diluted, as such poison must necessarily be, by the atmosphere in which it is diffused. Mr. Clark has overlooked a point very strongly, and,

\* See Page 386 of Vol. vi. of this Journal for a slight notice of this subject.

as we think, most correctly insisted upon by Virchow,\* that "every dyscrasia is dependent upon a permanent supply of noxious ingredients from certain sources." By a dissection wound a local depôt of noxious matter is produced, and from this depôt new quantities of noxious ingredients are continually being introduced into the system, hence the formation of glandular abscesses in the course of the lymphatics running from the wounded part, and hence the ultimate contamination and poisoning of the whole system;—taking place, in some instances, with considerable rapidity in consequence of the immediate connexion between the lymphatic vessels and the veins.

However, we entirely agree with our author as to the enormity of the evils resulting from the inspiration of an atmosphere loaded with putrescent substances, the result of animal exhalations.

"Sic etiam brevi ipse sibi homo acerrimum venenum compararet."

Mr. Clark remarks upon the *Diurnal atmospheric movements in India*, but he confines himself to those of the upper provinces. He offers some valuable observations on the influence of daily variations of temperature on fever, cholera, and other epidemic diseases; and then compares impure air and impure water as exciting causes of epidemic diseases, quoting Dr. Angus Smith to the effect that "the blood will become much more readily poisoned through the lungs than through the stomach."

In the second chapter, the subject of *Ventilation of Barracks and Tents* is treated of. The steady circulation of pure air is strongly insisted on, and then follows a description of what Mr. Clark considers an effectual apparatus for producing this desideratum. This is, in reality, the late Dr. Boswell Reid's "plenum method" with some little modification so as to render it suitable to a tropical climate. We surmise that it was this very method which was applied to the new Houses of Parliament in Westminster, and the effects of which brought down so many anathemas upon the devoted head of its enthusiastic inventor. However, Mr. Clark is convinced of its success; for, speaking of St. George's Hall, Liverpool, where it is in operation, he says:—

"On the occasion of my last visit, the sessions were being held,

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\* Cellular Pathology, translated by Chance, 1860, page 131.

and consequently all the Courts were crowded, and there were great numbers of people all over the place, yet the air was perfectly free from all unpleasant smell. The temperature in the Court room was 66°, and not the least draught was perceptible in any part of it."

When speaking of the perfection of ventilation, it is just as well to remember that the mere absence of odour does not necessarily imply the absence of danger; that the most dangerous of all emanations, as marsh and typhus miasms, are perfectly inodorous; and that some of the most offensively smelling gases are little, if at all, noxious to health.

Mr. Clark premises that his mode of ventilation implies strict attention to closure of the doors and windows of the barracks at night and during the heat of the day, and therefore every barrack should be supplied with proper doors and glass windows. The apparatus for barracks consists of a shaft or chimney of masonry six feet square inside, and thirty or forty feet in height, so as to give a supply of pure air from a considerable height above the surface of the ground. This should be placed about 300 feet or more from the nearest barrack, and at its foot a room must be erected in which the propelling fans are to be placed. The air drawn from the shaft, before reaching the propellers, may be either warmed or cooled, whichever may be necessary; the former by hot-water pipes, the latter by a series of large kus-kus tatties, or by an ice-making machine! (We fear that ice-making machines must be made to work a little better than they do in Madras before they can be considered quite applicable to this purpose.) From the fan room a system of underground masonry flues must be constructed. The main flues should have a transverse area of 4 feet 6 inches by 3 feet. The barrack flues running from these should have a diameter of 2 feet 6 inches by 2 feet, and one should run under the floor, in the middle of each building if the barrack is on the pavilion principle, and along the middle of each room if on the house and ward principle. From each barrack flue should proceed a series of diffusion pipes, each nine inches in diameter and made of earthenware. These pipes may be continued up the walls, or wooden cases may here be substituted for the pipes, and these should each have two diffusion openings of perforated zinc, one near the floor and the other four feet above. These should be placed between the men's sleeping cots. In very large barracks, in addition to the above, diffusion cases should be placed directly over



the central flue, with openings at the four sides for the exit of air.

It is supposed that by these means numerous eddies and other irregular movements in the air will be caused, and thorough ventilation of every corner of the barrack be produced, and this without appreciable draught. Of course, there must be roof ventilation for the exit of foul air.

For the ventilation of tents a modification is proposed. No air-shaft is required; one fan with a sixteen-inch propeller would ventilate for 100 men disposed in eight or ten tents. A tube made of canvass and wooden hoops, like a ship's windsail, is to be carried along the windward side of the tents, at the top of the kanaughts, and a smaller branch tube must pass off to each tent. This tent tube terminates in a diffusion reservoir to be suspended to the ridge pole, and from this small diffusion tubes, about eight in number, pass down to within eighteen inches from the ground. These are all of canvass and must be laced to the sides of the tent. The air enters the tent through eyelet holes in the diffusion tubes a little below the eaves of the tent and at the lower ends of the tubes. The tents must have ridge ventilation for the exit of foul air. The men should be supplied with iron cots.

For full details of the apparatus and the mode of its application, we must refer to the book itself.

Mr. Clark next enters upon the subject of *Water*. He acknowledges the necessity of a good supply of the purest water, and recommends that deep wells should always be used, surface wells and rivers always avoided. He suggests that the mouths of wells should be closed and pumps used—and he describes a Californian Lift-pump which appears admirably adapted to the purpose. He recommends that one or more drinking fountains should be attached to each barrack, the water supplied to which should run through pipes, and should be filtered and cooled by machine-made ice.

In this third chapter we have a section headed *Does impure water cause disease?* from which we make the following extracts:—

“ I consider that, however necessary it is to pay strict attention to the quality of the water, undue importance is very often attached to impure water as a primary source of disease, and that the real cause—namely, foul air—is overlooked. I would venture to predict that, as sanitary science advances, this view of the question will be established.”

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"Every one who has seen the Hooghly must have been struck with the intensely dirty state of the river. In addition to the sewage of the town of Calcutta and the other towns and villages on the banks of the river, thousands of dead bodies and carcases of dead animals float about in it, until the flesh is completely decomposed and the bones fall to the bottom; yet we have no positive proof that the water is injurious to health to the extent some authorities would wish us to believe. Were it so, few of the ships which arrive in Calcutta, would ever leave it again; for nine-tenths of the crew would be poisoned by the water. From the day a ship arrives at Calcutta until it leaves again—indeed, until the homeward voyage is half and sometimes wholly completed—the crew is supplied entirely with Hooghly water, which is not always filtered. But, under the most favourable circumstances, it is only filtered from the river alongside the ship by passing through a small filter, in the entire charge of natives, as rapidly as a pair of force-pumps can send it into casks on board; that is, at about the rate of 500 gallons per hour. I have myself seen, more than once, a dead body hanging across the bows of the filter-boat, without any attempt being made to remove it by the people in charge of the boat."

\* \* \* \*

"I made ten voyages to Calcutta, and had medical charge of four different detachments of European invalids from that place to England, and never saw any disease among the troops, crew or passengers, which I could attribute to bad water. \* \* \* It is to be observed (and I think deserves some attention) that I always belonged to large, well-ventilated ships, where every attention was paid to cleanliness and comfort, but the water was from the river, as with any other ship."

Our space will not permit of our giving some quasi-statistics in support of these views, which may be found in the book. As Mr. Clark seems fully impressed with the necessity of pure water for drinking and culinary purposes, we are inclined to pass this matter over with the remark that his much larger knowledge does not coincide with our lesser experience. We have repeatedly been called upon to prescribe for both Europeans and natives arriving at this port from Calcutta, suffering from low gastric fever, atonic dyspepsia, abiding nausea, dysenteric diarrhoea, &c., which they, as well as ourselves, have always attributed to the imbibition of Hooghly water, which they described as filthy in appearance, disgusting in odour, and of most offensive taste.

Chapter the fourth treats shortly on *food; quantity and quality; importance of vegetables; gardens; meat, Parasitic disease; and cooking arrangements.*

The fifth chapter is devoted to *Conservancy*. The "dry system" is said to be defective, and the "dry-earth system" is not alluded to. Mr. Clark is in favor of the plentiful use of antiseptics—especially McDougall's disinfecting powder and liquid. He advocates the use of iron latrines manufactured by Macfarlane and Co. of Glasgow, with the addition of a reservoir for the disinfecting substance. He is in favor of the utilization of the disinfected sewage by spreading it on grass land. He also recommends a moveable iron urinal for night use, which he figures and describes.

*Drainage* is shortly considered. Mr. Clark says he never saw a station which could not be drained; it is simply a matter of expense.

Recommendations as to *Sanitary Supervision* occupy the three and a half pages forming chapter seven. Chapter eight occupies two pages, and is on the *Construction of Barracks*. Chapter nine is headed *Financial Results*. This gives an estimate of the probable cost of the buildings, apparatus, &c., necessary for carrying out Mr. Clark's proposals as to ventilation, water-supply, conservancy and ablution; from which it would appear that, allowing a fair margin for management and working expenses, the saving to the State would cover the expenditure in two years.

Chapter the tenth contains a description of various apparatus suitable for sanitary purposes, such as a thermantidote, portable blower, portable filter, ambulance and air-tests.

And the concluding chapter of seven and a half pages is on *Prisons and Prison-discipline*.

We recommend the perusal of this little work to all interested in the sanitary condition of the soldier in India. We cannot say we are quite satisfied with it. There are many matters connected with hygiene which are not touched upon in the book, and the principal feature of the work, the system of ventilation, has been known in some instances to fail even under the hands of its original inventor, and at present it is untried in this country except upon a very small scale in the form of thermantidote working. Want of space prevents further remark.

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PART III.
MEDICAL MISCELLANY.

No. 7.—*Notes of a Case of Hepatic Abscess opening into the Pericardium.* By Asst. Apothecary R. HARVEY.

[Read before the Madras Apothecaries' Society.]

GENTLEMEN,—I have drawn up a summary of a case of Hepatic Abscess, which I will read to you now, illustrating a peculiarity in reference to its progress.

It is common enough to hear of hepatic abscesses opening on the surface of the skin, or into the stomach or bowels, or involving lung substance and opening into the air-tubes; sometimes into the cavity of the pleura, and at other times into the cavity of the peritoneum; but a case in which the abscess communicates with the cavity of the pericardium is regarded as very rare.

Dr. Dickman, writing in the *Lancet* in 1862, states that "liver abscess opening into the pericardium may be justly deemed an exception, and I believe it is admitted, by writers who have observed liver disease on a large scale, to be of rare occurrence."

The first recorded case of this nature occurs in Graves' Clinical Medicine, the abscess involved the left lobe of the liver and "opened into the stomach by three perforations, it also burst into the pericardium," where the latter is united to the diaphragm.

Rokitansky remarks that "cases in which the central aponeurosis of the diaphragm is perforated and pus discharged by longer or shorter sinuses into the pericardium inducing pericarditis are very rare. They have been observed by Smith and Graves, and once by ourselves." Dr. Morehead, in his "Researches on Disease in India," writing on this subject, says, "there is one recorded in the second number of the second series of the Transactions of the Medical and Physical Society of Bombay, by Mr. Fowler; and Mr. Leahy, a very intelligent Apothecary of the Bombay Establishment, gave me the notes of a case which he had observed at Peshawur in the Bombay Fusilier Regiment. In this case there were two abscesses; one communicating with the right lung, the other with the pericardium. I have myself never witnessed this issue of hepatic abscess."

Dr. Jackson, late Professor of Medicine in the Bengal Medical College, records a case in the *Lancet* for 1859, and

another case was published in the same Journal for 1862 by Dr. Dickman, of the Ceylon Medical Service.

The case reported by Dr. Fowler in the *Transactions of the Medical and Physical Society of Bombay*, though interesting inasmuch as the abscess had opened into the pericardium, ought not to be regarded as one of hepatic abscess perforating that membrane. In the post-mortem report of the case, the following passage occurs:—" *Abdomen*, liver large, substance healthy, between its upper surface and the diaphragm was an abscess with distinct walls, not connected with the substance of the liver, and communicating with the pericardium by an ulcerated opening."

These, excepting the one by Dr. Fowler, are, as far as I have been able to ascertain, the only recorded notices of cases of this description.

The case I am about to relate was, up to a short time before the patient's death, under the care of Dr. Aitken, Medical Officer of the Sappers and Miners, who, although not in medical charge at the time of the patient's decease, was present at the post-mortem examination with Dr. Ranking, the Officer in temporary charge of the corps.

James Carter, aged 29, 2nd Corporal, Sappers and Miners, resident in India 4 years, was admitted on the 13th July 1856, on account of pain in the right shoulder, loins, and knees, which he had been subject to in Burmah, where he was obliged to be out a good deal. Pulse frequent, skin warm and moist; tongue clean; bowels regular. Four days after admission into hospital he complained of intense pain in the right hypochondrium, and which was preceded by slight feverishness the evening before. On the night of the 17th instant he had several dark-green colored evacuations.

After the application of a blister to the side and a mustard poultice (at his own request) to the shoulder, the pain left him, and he appeared to improve, the bowels, however, continued relaxed, the evacuations being of the same character as before. Some days afterwards (29th) pain in the shoulder and side returned, and he complained besides of a very troublesome cough and of sleeplessness—on the following morning he felt worse and was expectorating bloody mucus with some clotted blood, there was considerable dullness at the back part of the base of right lung, and a want of respiratory murmur. The symptoms now pointed to the base of the right lung as being the chief seat of morbid action. They were the most prominent, and continued so to the end.

After some days of suffering, characterized particularly by distressing cough, expectoration of bloody mucus and dark bilious loose evacuations from the bowels, a change for the better took place, lasting, however, but for a short time.

On the 28th August (the month following) the report is as follows :—"Passed a bad night, cough very troublesome for the last twenty-four hours, he seems a good deal exhausted, pulse feeble, skin cool and moist, has not perspired much, respiration obscured by loud mucus rattling in the affected portion of lung—percussion dull, expectoration sanguino-mucous, appetite bad." Three days after this he had a fit of vomiting—the vomited matters could not be examined as they were mixed up with the mud on the floor—the fit occurred during the night, on the following day the report is that "he had a feverish paroxysm last night, which went off towards midnight with profuse perspiration."

From the subsequent reports of the case, the patient does not appear to have had any more febrile exacerbations terminating in profuse sweats, he had occasional fits of vomiting, the matters vomited were carefully examined each time, but no trace of purulent matter could be discovered, and beyond the feeling of exhaustion after each fit of vomiting he neither appeared getting better or worse.

It was now considered advisable to give him the benefit of a change to Vizagapatam. He was accordingly sent on sick certificate to that place, but he did not go further than Rajahmundry, a distance of four miles, for he was brought back in a much worse state than when he left the station (Dowlaishweram).

The following note of his case by Dr. Ranking, at Rajahmundry, was sent with him :—

"Sent for to see Corporal Carter at the Public Bungalow. Has had a strong rigor, and is expectorating bloody sputa and had also three stools, containing much mucus and blood. He is bathed in cold sweat, has a small pulse at 110, and is very low.

The symptoms point to hepatic abscess being evacuated by the lung."

From this time he never once rallied, but gradually sank and died.

The following is the post-mortem report of the case :—

"Body emaciated. Head not examined. Chest—right

lung pushed upwards by the liver, and occupying a considerably smaller space than natural, with the exception of the upper lobe, the remaining portions of the lung adherent to the structures around;—to the ribs behind and externally by pretty firm bands of adventitious membrane, internally inseparably so, to the pericardium and its base excavated, forming the upper wall of an hepatic abscess. *Left lung* healthy. *Pericardium*.—On opening the pericardium, it was found to contain a quantity of purulent matter, mixed with large flakes of lymph, its whole surface lined by a tolerably thick layer of lymph, and from the bottom of its cavity a large mass of this substance was removed. The right wall of this membrane, at about its centre, presents a ragged opening of the size of a half rupee leading into a cavity (the hepatic abscess) on the other side.

Heart large and flabby, its whole external surface, together with the commencement of its great vessels, covered by a membrane similar to that lining the pericardium.

Abdomen.—*Liver* enlarged in all its diameters, extending right across and occupying the left hypochondriac region, superiorly as high as the 4th rib, and below to within two to two and a half inches of the iliac crest of right side. Upper surface inseparable from the diaphragm, of a nutmeg-grey color and very friable, upper third of right lobe occupied by an abscess, capable of containing about a pint and a half of fluid. The abscess appears of an oval form, and lying obliquely, its long diameter taking a direction downwards and outwards from left to right, its upper end being at the opening in the pericardium, through which it discharged a portion of its contents into the cavity of that membrane, its lower end adhering firmly to the fifth and sixth ribs, at about their middle, where the periosteal covering of these bones was removed, its upper and outer wall formed by the excavated base of lung, and its lowest and inner wall by the liver—on the upper surface of the left lobe about its middle there was a yellowish brown tumour, soft, of the size of a marble, which, on being cut, gave exit to a tea-spoonful of thick purulent matter; at the base of the tumour was an opening leading into a cavity in the substance of the lobe—the remains of an old abscess—the surface of the lobe here was shrivelled and thickened.

Other viscera not examined.

[The specimen was forwarded to the Medical College Museum, where it can now be seen.—ED. M. Q. J.]

No. 8.

**A CONSPECTUS OF MEDICAL AND SURGICAL
PRACTICE IN INDIA.****HOSPITALS AT MASULIPATAM.***(Under the care of Mr. EVEZARD.)***CASE I.—DIABETES MELLITUS.**

CHELEMIAN, age 55 years (?), pauper, was admitted June 23rd, 1860, bringing with him a bottle of pale-colored urine, and stating that he has passed daily about 12 pints for the last month, and that he is thirsty, and has been living *very low*. Urine Sp. gr. 1,045, sugar discovered by both Moore's and Trominer's tests. Patient states that he has been passing urine more frequently than usual for three months, and during the last month the quantity increased as mentioned above. Great thirst, tongue furred and dry. Patient formerly a fat man, now much reduced. Has not been dissipated. None of his relations ever suffered from a disease of this kind. *Now* states that he drank a good deal of toddy, and got drunk upon $\frac{1}{2}$ a bottle of arrack once a month. Pain in Lumbar region.

Diet.

Mutton, 1 lb.
 Bran bread, 8 oz., toasted.
 Milk, 1 pint.
 Arrack, 2 measures.
 Quinæ Disulph., grs. ii.
 Acidi Gallici, grs. v.
 Sp. Vini gall.

25th.—Passes now only 4 lbs. in 24 hours; appetite greedy; no more food allowed. Sp. gr. same; gums spongy; mouth dry.

Tinct. Opii. \mathfrak{m} v. was added to each dose of the mixture.

27th.—Passed 4 lbs. 14 oz. yesterday during the 24 hours; thirst extreme; Sp. gr. same.

29th.—1 lb. 12 oz. in the day, 2 lbs. at night, Sp. gr. 1,040.

1st July.—Same; great thirst, asks for more milk; at present gets 12 oz.—16 oz. now given.

3rd.—From yesterday morning to this 4 lbs. 12 oz., Sp. gr. 1,040; less thirst; skin dry.

11th.—3 lbs. Sp. gr. 1,039.

14th.—3 lbs. Sp. gr. 1,040, altogether better. Repeat medicines.

17th.—5 lbs. Great hunger and thirst.

18th.—5 lbs. Bowels costive.

19th.—3 lbs. 4 oz. Sp. gr. 1,035. Rep.

20th.—Somewhat less than 3 lbs. Sp. gr. 1,053.

6th August.—2 lbs. 12 oz. Sp. gr. 1,032.

Discharged, relieved.

CASE II.—VULNUS INCISUM.

Mahomed Ali, 9 years, Mussulman, was admitted July 20th, 1860, with a bayonet wound one inch and a quarter to the inner side of the left nipple and on a level with it. He received the wound by running on to the bayonet of one of the sepoys who was clearing the streets in a road at the Mohorrum festival. Large and loud crepitation heard all over the left chest above the nipple. A good deal of palpitation of the heart, accompanied by a tinkling sound. The boy had been fasting for one day. Bowels costive; pulse small and very quick. The number of beats can hardly be distinguished.

Vesperi.—Strapping and bandages, &c.

Skin hot and dry; pulse 140.

Some conjee was given soon after admission.

Acidi Citrici grs. ii;

Aquæ ʒ;

Sacchari ʒ ss.

For one dose; repeat frequently to allay thirst.

R. Pil. Scamm: Co. grs. v.

Calomel grs. iii.

At bed time.

Sinapisms to the feet constantly.

29th.—Bowels moved twice; pulse 90. Feels easier.

30th.—Crepitation less; respiratory murmur loud over left chest.

2nd August.—Sounds almost natural; wound nearly healed; pulse full and strong.

4th.—Not quite cicatrized yet, the first sound too swelling and loud, and the pulsation is diffused; patient still lying down.

6th.—Sound apparently healthy: patient still weak. To sit up a little.

7th.—Discharged, Well.

CASE III.—TUMOUR, OF BREAST AMPUTATION.

Mungamah, age unknown (40?), pauper, was admitted August 14th, 1860, with a large tumour of left breast, nipple not retracted, but a large fistulous opening on the inner side, about three inches long, running in a course between the lacteal tubes and extending from about an inch on the outer side of the nipple to the anterior border of the axilla. Nearly filled with large fungous granulations discharging a large quantity of a thin whey-like fluid, about 3 ii. per minute. The patient looks very care-worn, &c., from the excessive discharge; but cannot be said to have cancerous cachexia. She has the zona senilis—her hair is black, interspersed sparsely with grey; has had two children. The breast gives out a very offensive smell, probably from uncleanness. The tumour commenced about a year ago, and the sore about five months since. The patient, anxious to have the tumour removed, I accordingly removed the whole of the mamma in the usual way—not much blood lost. Five ligatures required, patient becomes sick and faint on account of the chloroform, which does not appear very good.

On opening the tumour which after removal weighed about 6 lbs., it was found to consist principally of a number of cysts involving the lacteal tubes, which were diluted and filled with thin whey-like fluid. For about 3 inches all round the original wound the gland was infiltrated with a fibrinous mass—whitish and greyish-white in appearance. No cancerous cells could be discovered on examination under the microscope.

18th.—Wound looking well, two ligatures came away.

20th.—The granulations looked too white and flabby.

Dressed with 1 pint of Tinct. Myrrh to 2 of water.

23rd.—Going on well.

The wound healed well, with the exception of a small piece near the outer margin, which gradually began to swell and to discharge a serous fluid similar to what had been observed before the tumour was removed. It was touched with Potassa Fusa and then with Nitric acid several times, and at last ceased to discharge: but very rapidly turned into a hardened fungous mass, which appeared to be growing rapidly. There was no pain, except in a small spot at the upper part of the fungous granulations. I removed this mass to-day, and pared the skin all round, also removing a hardened gland extending up into the axilla. Several

arteries bled actively on tying them, the ligatures came away several times, and the arteries broke down under the forceps; they appeared atheromatous, and I was obliged to resort to the actual cautery to stop the bleeding.

3rd November.—Wound dressed.

5th.—Granulations looking healthy.

29th.—Discharged, well. I heard that the disease returned, and patient died in her native village a year afterwards.

CASE IV.—FRACTURE, GANGRENE, &c.

Adilutchmi, female pauper, age 40, was admitted 9th January 1861, with fracture of the lower third of the right fibula and tibia, stated to have been produced by a direct blow from a stick. There is a slight bruise over the seat of the fracture, and a small triangular wound Δ just behind and above the inner ankle, from which a small quantity of venous blood exudes.

Put up in the usual way. Pulse weak; tongue foul.

R Jalapæ Co. ʒ ij.

Statim.

Diet reduced.

10th.—The splints removed, as there is much swelling of the ankle. Blood continues to exude, and appears to come from one of the venæ comites of the posterior tibial artery. A light compress placed over the wound.

11th.—Going on well.

12th.—Sloughing came on rapidly during the night. Patient has been addicted to liquor, and now calls for some.

Arrack ʒ ss. every 4th hour

Morphiæ Hydrochlor gr. 1-8th at bed time.

Dressed lightly, and with a fermenting poultice, &c.

24th.—A line of demarcation appearing just above the fracture. Patient very weak. Pulse thready, and scarcely perceptible.

Quinæ Disulph grs. v.

Acid Sulph. dil ℥ viii.

Aquæ ʒ iss.

For a dose repeat three times a day.

The arrack not appearing to keep her up

Brandy ʒ ss. every 4 hours.

Repeat Morphiæ.

28th.—The foot nearly dropping off at the seat of fracture.

Several tendons cut with a scissors, and foot removed, Patient very weak, and restless at night. Sleeps a little.

30th.—There is a sharp angular piece of bone of the posterior surface of the tibia projecting inward—this appears to have been the piece of bone which produced the wound in the vein, but could not be seen till now : it is firmly fixed.

Morphice Hydrochloratis gr. $\frac{1}{2}$.

Chloroform \mathfrak{m} ii.

Alcohol 3 i.

Aquæ Distil. 3 iss., at bed time.

16th February.—A good deal of thick pus discharged from the upper part of the wound, appearing to come from the popliteal space. Slight emprosthotonous tetanus, constriction of the throat. Pulse thready ; skin cold. The small piece of bone is still adherent and is probably irritating the nerve—re-placed the bone.*

The same : does not take much nourishment.

Died without much distress.

Post Mortem.—All the organs healthy, but bloodless. Heart somewhat atrophied and fatty.

CASE V.—GANGRENE FROM NATIVE SPLINTS. AMPUTATION AT SHOULDER-JOINT—RECOVERY.

Ali Rajar, Mussulman, age 17, was admitted, 18th February 1861, with the whole of the left upper extremity in a state of gangrene—the result of compression by native splints, which had been applied eight days previously ; but were removed before he was brought to the hospital. One of the splints appears to have pressed severely on the humeral artery. There is a good deal of redness, swelling pain in the shoulder, and much tenderness over the situation of the axillary artery, and the skin is removed from over the part where it becomes the brachial.

Pulse weak, 100 ; skin hot and dry ; tongue furred and red at the edges. Diet, Spoon—milk 1 pint, mutton curry $\frac{1}{4}$ oz.

Acidi. Nitrici. dil. \mathfrak{m} xv.

Decoct. Cinchonæ \mathfrak{z} i.

For one dose, repeat three times a day.

Dressed with chalk, camphor, lime-water, &c.

* ? Resected.—ED. M. Q. J.

21st.—Removed a good deal of the putrid mass. Patient vomits his food.

Creasoton ℥ i.

R Tinct. Lavandulæ. ℥ v. in milk.

23rd.—Ulcerating in an irregular line of demarcation, one point of which reaches to the anterior margin of the axilla.

25th.—The line of demarcation looking cleaner. Still some swelling in the shoulder. Patient keeps down his food when given in small quantities.

28th.—Patient keeps down his food, but is still suffering from hectic. Tongue pale and bright-red at the edges; skin hot and dry; pulse weak, 95 in the day, and about 105 towards evening. Matter appears to be spreading up among the muscles, the stench is intolerable. The edges, however, of the line of demarcation in the skin appear healthy, and there is now very little tenderness in the region of the subclavian and axillary arteries, and they beat strongly. It appears, therefore, safe and expedient to operate now before the patient becomes weaker.

The limb removed this morning at the shoulder joint by means of transfixion, a posterior and an anterior flap. As is frequently the case, the assistant who had charge of the subclavian artery either could not command it, or let go just as I had cut through the axillary; but as I took care to cut through this the last, and had warned Second Dresser Vencatasawmy to follow the knife with his fingers when I was cutting the anterior flap, no harm resulted. The artery gave one spurt, but before I could throw down the limb and transfer the knife to the other hand and seize the artery, Vencatasawmy had done so, our hands came together. Besides the axillary, it was necessary for me to tie the subscapular and a branch of the thoracica acromialis. Fortunately, (as he could but ill afford it) the patient lost but little blood as the morning was cold and the patient was faint, and vomited from the chloroform, from the effects of which he was some time in recovering.

Vespere.—A good deal of pain. Pulse 95 weak,
Cold water dressing.
Tinct. Opii. ℥ xxv.
Aquæ Menth Pip. ʒ iss. Statim.
Diet—Spoon.

1st March.—Patient slept well and has a good appetite. Skin still hot and dry ; pulse and tongue same. Chicken broth Oi., bread 8 oz. milk Oi., sugar 2 oz.

2nd.—Stump dressed—a good deal of swelling ; but no pain.

4th.—Stump looking well and suppurating freely ; a little synovial fluid still flowing. A good deal of tenderness in the stump, particularly near the ends of the nerves, but not in an unusual degree.

9th.—The ligature from the main artery came away to-day. Stump healing ; pulse 84, weak ; appetite good.

16th.—Healing well, a good deal of pus ; but healthy Patient weak still, and feverish at night.

Ferri Citratis et Quinæ grs. ii.

Repeat 3 times a day.

1st April.—Nearly healed. General health does not seem to improve. Mutton curry 4 oz., brandy $\frac{1}{2}$ measure.

17th.—A small blister found during the night at the upper end of the circatrix, and burst, leaving a sore. A good deal of neuralgic pain in the stump.

Ext. Hyoscyami gr. i.

Camphoræ gr. i.

Repeat 3 times a day.

19th.—Less pain.

21st.—Sore not quite healed, no pain.

Hyd. Nitric Oxide sprinkled on the sore, and water dressing with Tinct. Myrrh, one part to three.

26th.—Discharged, well.

The patient came from his village to see me about six months afterwards in good health, and the stump a handsome one. The tendency of the clavicle to tilt up has been counteracted—by the patient occasionally carrying his implements of husbandry or a cowrie on the affected side.

CASE VI.—CATALEPSIA ?

Paré Begum, 32 years, Mussulmani.

October 11th, 1861.—This patient was, on admission, in an insensible state, unable to speak, her eyelids closed, the pupils dilated : when the eyelids were raised they fell again on release, and closed of their own accord. If an arm was raised it fell in a lifeless manner on being released. The

lower jaw was relaxed, but the patient could be seen to breathe. Pulse 100, weak; bowels have not been open since about 6 hours before this fit came on. The friends state that the patient has been in this state for about 20 hours, and that for four days before this she had a bad smell in her nose, and on the day of the fit coming on she complained of a feeling as if her brain was being shaken up, and a tightness across the chest accompanied by difficulty of breathing, and pain in the head and face.

She has been subject to these fits for about 8 years. They commenced six days after she had received a severe blow from her husband on the top of the head (about the centre of the apex of the skull) with a nailed slipper, after which blow there was a raised swelling on the top of the head, about the size of the palm of the hand, and which pitted on pressure. These fits have only occurred about four or five times since the blow. The patient's husband deserted her after the quarrel. She has one child, and has been living single since. Patient able to swallow a drop or two of milk, but with great difficulty.

Enema of Turpentine.

Turpentine stupes to chest.

Blister to the back of the neck.

The Bowels were moved by the turpentine effectually, and an hour after this, she was able to swallow, and broth was given by the mouth; she now appears sensible, but cannot speak. The broth was mutton.

Quinæ Valeriantis gr. i.

In a Pill.

Diet. Mutton curry.

15th.—Able to speak.

18th.—Attempted to walk, but felt giddy and weak.

22nd.—Pain in the head when she moves. Giddiness, &c.

26th.—Discharged. Well.

CASE VII.—TUBERCULAR DISEASE OF FOOT.

Admitted 20th January 1864, with right foot enlarged to about 4 times the natural size, and studded on the dorsum

and instep with large pyramidal tubercles discharging unhealthy matter. The swelling extends some way up the leg, and there is a solid œdema as far up as the tuberosity of the tibia. The history of the disease is obscure ; but the patient states that he has had it 10 years, and is now anxious for the removal of the limb on account of the weight and pain. Amputation performed in the upper third by a sweep of the knife in front transfixion and a posterior flap, and although the leg was removed as near as possible to the tuberosity, 4 ligatures were required, the artery apparently dividing higher up than usual. When removed the mass was found to consist of a hard cartilaginous substance involving, and continuous with, the skin and interspersed with cysts of cheesy matter, corresponding to the tubercles on the surface. The muscles for a long way up were wasted into a gelatinous matter, and their sheathes infiltrated with fluid. The arteries in the diseased mass had become atheromatous, and the cartilaginous mass of the disease merged gradually into the bones of the foot, so that it was difficult to distinguish the bony matter from the rest of the disease.

27th February.—The stump healed well. Patient discharged with a handsome fleshy stump and a wooden leg.

No. 9.—*On the relation existing between atmospheric vicissitudes, and Epidemic Cholera, at Mundium, in 1861.* By S. AUROKEUM PILLAY, Subordinate, Medical Establishment, Madras Presidency.

IN obedience to Division Order dated 29th March 1861, by Major-General the Honorable A. A. Spencer, C. B., Commanding Mysore Division, I was directed to proceed forthwith in charge of a European party proceeding to Wellington, on sick certificate, and to remain at Mundium to afford medical aid, while parties were passing to and fro from Wellington, and until the subsidence of cholera then said to be prevailing at Mundium and on the Mysore roads. The village named Mundium lies directly south west of Bangalore, about 58 miles, situated on an elevated spot which is noted in Southern India for the manufacture of white cumblies (native blankets) and thick horse jhools, &c. The following is a concise narrative of the outbreak of Cholera in the village near the Rest House where I was located.

The Cholera, or "Maweeswarree Oobuthra," the latter is the term used by the natives of the Mysore country in honor of the goddess "Maureummah," appears to have made it first annual visit somewhere about the end of February, in a small hamlet, lying adjacent to the talook towards the north, where the scarcity of water seems to have been very great prior to the outbreak, for the tanks and pools were said to have been short of their supply, and it is evident, from authorities of the present day,* that whatever lowers the vital powers, will, in some measure rather pre-dispose the system as a receptacle for any miasmatic disorders; the drought alluded to seems to be an excitant cause with its attendants, hot and oppressive weather, fatigue, improper food from scarcity of rations, or starvation, intemperance, and free indulgence either in country arrack or toddy—the latter malpractice is very common among the lower classes of village servants. The deleterious practice also exists of allowing a well or cistern to exist in all houses to receive excreta, all sorts of rubbish, and other filthy matter found about the court-yard of the house: this is quite contrary to what nature approves for the very exhalation emitted in a concentrated form from the cistern or pit is enough to pollute the surrounding atmosphere of villages and towns; this practice is very common in this part of the province, and requires careful consideration and correction by the Municipal authorities. The crowded dwelling-houses and the contiguity, of the hamlet people to the bazaar in Mundium, is reported to have been the cause of the outbreak, and two or three days before the occurrence of cholera, the Rest House keeper informed me of a gust of wind blowing from it to south between 3 and 5 P. M., carrying with it a very unpleasant and offensive smell which actually kept him and family away from that night's supper; after this the deaths from this disease began to increase (the total number I do not know), until a heavy down-pour of rain, accompanied with much thunder and lightning took place, since which I was assured the disease began to subside.

It will not be out of place to remark here on the evil of bad smell, for the north east corner of the barracks in Fort Saint George, which is built on a drain, generally

* Vide recent publications of Drs. Morehead and Moore, on Diseases of India, on Cholera.

sends to hospital three men to one going from any other part of the barracks ; sometimes none go from any other part of the buildings. Query?—Can the CHOLERAIC or MORBIFIC state of the surrounding air be disseminated or overpowered by fall of rain accompanied with thunder and lightning?

Dr. J. Annesley,* the late President of the Medical Board, Madras Presidency, opines—"There can be no doubt that a very unusually disturbed season prevailed at Madras and its dependencies for several years, previous to the appearance of cholera." The above seems to agree with the recent outbreak of the disease in and adjacent to the village of Mundium.

Another source, perhaps, of the outbreak of the disease under review, is the water the villagers and travellers partake of, viz., the large tank by the side of the main road leading to Mysore, which is also said to have run short of its supply ; consequently the water of the tank, (stagnant) opposite to the Rest House, had to be used, although the fluid was quite greenish, and myriads of animalculæ were seen by the naked eye floating and moving ; about and, to prevent the organic bodies passing into the mouth while drinking, the easy plan adopted by the villagers was to strain or filter the fluid through a thick piece of calico, and the same practice is followed by native travellers who learn the process from the villagers, when cooling their parched mouths, or using this water for culinary purposes.

Our principal Military cantonments, and thickly populated towns and cities, are often visited unexpectedly by this direful malady, in consequence of the frequent intercourse of numerous travellers mixing with the people of the towns, either bringing the poison in an active or latent state, and thus many valuable lives are lost—European and Native—so the strength of our British Army—both Europeans and Natives in India—is considerably reduced every year.

BANGALORE, 4th November, 1864.

* Vide his *Diseases of India*, page 1149, Second Edition.

No. 10.—*Notes from Medical Practice.* By JOHN SHORTT, M.D., M.R.C.P., F.L.S. &c., &c.

No. 1.—*A Case of Fatty Degeneration of the Kidney, terminating fatally from Hæmaturia.*

PATCHAMYAN, Æt. 65, convicted prisoner, No. 361, sentenced to 7 years' imprisonment—6½ years in jail.

19th August 1864, admitted. This patient was brought to hospital yesterday, after visit (10 A.M.) in consequence of passing large quantities of bloody urine, which he states came on only a short time prior to his admission into hospital. Pulse small and feeble, skin natural, complains of no pain. Bowels stated to be regular, the blood and urine are well mixed together.

Passed rather a restless night, and is now cold and pulseless, with a ghastly appearance of countenance.

Is an old man, and has been for the last 6½ years an inmate of this jail.

20th.—The patient continued to sink, and expired quietly at 11 P.M. last night.

Post mortem Examination.—*Nine hours after death.* The body of a stoutish short old man. In consequence of his friends claiming, and being clamorous about removing, the body, the examination was limited to the opening of the abdominal cavity and inspecting the kidneys and bladder. The parietes of the abdomen was lined with a thick layer of yellow fat several inches deep, and the intestines were loaded with the same material. The kidneys were imbedded to the depth of some 3 inches in a bed of yellow granular fat, and even the base of the bladder was lined with a layer of nearly an inch thick of fat.

Kidneys.—Right, when freed of adipose tissues, weighed 9 ounces, was large, and irregularly raised on its convex surface, and greatly congested, with several cysts containing serous fluid, the largest was that of a full sized marble.

The cortical and uriniferous tubes were completely atrophied in some places, and fatty granular matter had taken their place.

The left kidney with its granular mass of fat weighed 8 ounces, and on the convexity was found a large serous cyst ;

no trace whatever of the cortical or tubular portion of the gland was visible, except the membranous sacs formed by the infundibula and pelvis. The bladder contained nearly eight ounces of bloody fluid, free of urinous smell, with the mucous membrane slightly congested and of a pinkish colour.

Remarks.—This case is of considerable interest; the patient, a Mussulman, was a respectable looking old man, and had always something to say for himself, whenever I visited the Jail, he was known to be in good health. In 1859, he was in hospital on two occasions in consequence of intermittent fever: since that period he never came under treatment as an in-patient, but he came occasionally to ask for a purgative of his own accord, and several times complaining of pain in the loins which he attributed to rheumatism, and on receiving some stimulating liniment, he returned to the jail immediately. All along he looked the perfection of health, though latterly I remarked that he was looking rather sallow; with the above exceptions, he never complained of any ailment, nor did I notice anything particular about him up to his last admission.

No. 2—*A Fatal Case of Rheumatism from blocking up of the right Auriculo Ventricular opening by a fibrinous clot.*

VEERADOO, Æt. 35, convicted prisoner, No. 1873, sentence 14 years.

20th September 1864.—Admitted complaining of rheumatic pains, complains more especially of the right knee joint which is swollen, hot, and painful. The patient is subject to the disease. On admission he took a purgative, and a blister was applied to the knee joint, and on the healing of the same the part was painted with Tinct. Iodine, which, in the course of a few days, relieved the part of pain, but the swelling continued. On the 25th the pain returned, when the joint was again blistered with relief, the pain and swelling having subsided, but leaving behind some stiffness of the part, for which frictions with turpentine liniment and bandage were applied. On the 4th of October he complained of pain in the right side at the junction of the cartilages with the second and third ribs, the part

was hot and painful to the touch. The patient was again freely purged, and he took Iodide of Potassium with Bark, and a small blister covered the seat of pain, from which he obtained relief. On the evening of the 5th I received a note from the Dresser reporting the patient's death.

The Dresser states that the patient complained of difficulty of breathing at about 2½ P. M., when the pulse at the wrist was imperceptible and skin cold, the patient was seated at the time, he was made to lie down, and had an ounce of arrack with water given him, and this was repeated in 15 minutes, he did not rally, but expired at 3 P. M.

Autopsy.—17 hours after death. Body of a small made man, but well nourished. The chest and abdomen were covered by nearly half an inch of white subcutaneous fat. On opening the chest, the pericardium was found distended half full with serum. The heart seemed large, soft, and flabby, the outside lined with fat, the right auriculo-ventricular opening was blocked up by a large fibrinous clot, the valves had their free margins greatly thickened. The left ventricle also contained a flat layer of organized fibrine, and the aortic valves were greatly puckered, and incomplete. The substance of the heart itself was soft, and broke down readily by pressure between the fingers. Heart weighed 9 ounces. Liver large and highly congested, weighing 2½ lb. Kidneys small and atrophied, substance infiltrated with fat, weighing 3½ ounces each, all the other parts were normal. The sternal ends of the second and third ribs on the right side near their junctions with the cartilages were soft and disorganized, and the periosteum was detached to the extent of an inch in each of the two ribs this was the seat of pain of which the patient complained some two or three days before his death.

Remarks.—This is an interesting case from the abruptness with which it proved fatal; the disease (Rheumatism) was syphilitic in its origin as acknowledged by the patient on admission, and the diseased state of the bones of the second and third ribs, as exhibited by the autopsy, is further confirmatory of the patient's statement. The fatal consequence was brought on most probably from deterioration of the blood, aided by the fatty disorganization of the substance, and disease of the valves, of the heart.

No. 3.—A Fatal Case of Polypus of the Heart, with symptoms of Anæmia, and general Dropsy.

MAHOMED ANSOO, *Æt.* 36, convicted prisoner, sentenced to 5 years' imprisonment, in jail 8 months.

26th September 1863 admitted: came to hospital complaining of loss of appetite, and general debility, looks anæmic, with pale and slightly puffed countenance, and swelling of the lower eyelids. Tongue pale and furred, pulse small and weak, skin cold and moist. Is of a stoutish, robust make of body. On the 3rd October the patient complained of oppressed breathing, the voice resounds throughout the chest. Heart's action feeble, no other physical sign apparent to the sight, touch, or ear. Bowels regular, passes about 12 ounces of urine in the 24 hours, which is of a pale colour, sp. gr. 1,010 of neutral action, and free from albumen.

On the 5th the face became quite puffy, and the feet œdematous. The secretion of urine under treatment increased to 2lbs. in the 24 hours, with a sp. gr. of 1,015. On the 26th, symptoms of general dropsy increased, whilst the face became quite puffy, and the secretion of urine again diminished in quantity, and on the 28th it was reduced to 12 ounces in the 24 hours. On the 30th it again increased to 2lbs. of same sp. gr., but of acid reaction.

6th November 1863.—The patient's breathing is becoming affected, whilst the general dropsy is subsiding, complains of being troubled with a cough, and expectorates some frothy fluid. On the 7th patient expired quietly at 6½ A. M.

Post mortem Examination.—*Six hours after death.* Face swollen and puffy, extremities swollen, trunk has an emaciated appearance. *Chest.*—On laying open this cavity, the pericardium appeared greatly distended, about a pound of bloody serum in the cavity of chest. Lungs healthy; on opening the pericardium there was some 2 ounces of serum in it, which, on being removed, coagulated spontaneously into a tremulous, rather consistent jelly. Both the cavities of the heart were greatly dilated with dark fluid blood. The heart looked large but devoid of fat, and having a worn, flabby appearance. The right ventricle was greatly dilated, and the walls were scarcely two lines in thickness. At the bottom and sides of the ventricle, between the meshes of the columnæ carneæ were found some six or eight small polypuses encysted with pure creamy pus.

The polypi were some irregular, others pyriform, and one or two circular in form, and the largest was about the size of two large orange pips put together, and the smallest was about the size of a single pip. The cysts or polypi were smooth and shining externally, resembling medullary substance, whilst the internal surface was irregular and filled with pus. These were united or adherent apparently to the inner lining membrane of the heart.

The structure of the heart was soft, readily breaking down under pressure of the fingers, and the substance was of a pale colour. The mitral and tricuspid valves were fringed with vegetation.

Heart weighed, free of its covering, 13 ounces.

Abdomen.—This cavity contained about 2 lbs. of serum. Liver dark coloured, weighing 2lbs. 5 oz. The kidneys were pale coloured, devoid of fat, and the cortical portion somewhat atrophied. Right weighed $3\frac{1}{4}$ ounces, left $3\frac{3}{4}$. Intestines blanched and distended with air,—gall bladder and its walls greatly infiltrated with serum, and contained some greenish coloured viscid bile.

Remarks.—This is not a case of common occurrence, and agrees with the description given in Dr. Hope's Diseases of the Heart, page 526, under the head "2. *Slightly organized Polypi.*"

No. 4.—*A case of Phlegmon, followed by Erysipelas of the Head and Face, successfully treated with stimulants.*

MOONOOSAWMY, Æt. 32, Cultivator, caste Malabar.

19th September 1857.—Admitted with an abscess at the back of his left ear, states that he suffered from ear-ache about a month, and that he had recourse to various native remedies without relief, and that the pain got better when the abscess made its appearance, obscure fluctuation is felt as if matter is formed under the temporal fascia; pulse excited; skin warm; bowels constipated.

20th.—Abscess opened, 2 ounces of thick pus let out followed by considerable relief; bowels freely opened.

25th.—Opening discharges freely, head hot, swelling about the part increased.

27th.—Discharge less, the sub-maxillary and parotid glands are swollen and painful. Is feverish.

28th.—Has had much heat of skin since last report ; pulse 82 ; skin warm ; bowels open.

30th.—Heat of skin continues with increased swelling of left side of face and ear : an opening posteriorly towards the mastoid process to the extent of an inch, and a counter-opening at the temple were made, some pus let out ; the whole of the temporal bone seems bare ; the end of the probe grates on the bone. Pulse 88, soft ; skin warm ; bowels freely moved.

2nd October 1857.—Head and face attacked with Erysipelas, and are much swollen.

4th.—Head and face are greatly swollen, and extremely painful to the touch ; eyes closed, and the features are completely disfigured, with vesications about the nose. Pulse 100 ; skin warm. Was delirious for the greater part of the night, starting out of bed ; is somewhat collected now, the treatment hitherto consisted of purgatives, salines, antimonials, opiates, calomel, and James' powder, &c. The face and head were streaked with nitrate of silver, no discharge from the abscess, the patient was now placed under a stimulating plan of treatment, one ounce of brandy diluted with chicken broth was given every 2 hours, this acted as a charm, he was a convalescent on the 8th, and on the 19th he was discharged well.

No. 5.—*Remarks on Hernia, with an account of a Case of Strangulation, in which the operation was performed but proved fatal from Diarrhœa, on the twenty-first day after operation.*

HERNIA.

THIS disease, is of rather frequent occurrence in Southern India. Natives often suffer from it, and many appear to know the value of a truss, some resort to a rude Indian made truss, the pad being formed of a brass plate jointed to the spring, which is fastened round the pelvis. The pressure exerted on the abdominal ring by this instrument is very irregular. I have only seen one such instrument. All Surgeons look upon Inguinal hernia as a serious affection, although, perhaps, with a well fitted truss a patient might be capable of much exer-

tion. I remember being told by a senior member of our Service that he did not consider a reducible hernia a disqualification in a soldier for field service, "all that was required," he said, "was a good truss, and the man would give no further trouble." This may be the case in the majority of instances; such an ailment always gives to the idle an excuse for admission into hospital, and may at any time become so complicated as to threaten life. Surgeons of past times, as well as those of the present day, have contrived many operations for the radical cure of hernia, but surgical interference always seems to be attended with more or less risk to life, and it is only in those cases in which strangulation has taken place and life is placed in imminent danger that we are justified in having recourse to such operative proceedings as are likely to save the patient from impending death. among modern operations Mr. Wood's seems at present to be the most effective and successful, but it requires, on the part of the operator, a thorough knowledge of the parts that are involved in the operation. I have seen Mr. Wood operate and examined some of his successful cases that were exhibited in King's College Theatre, and the satisfactory results of these operations must have been very gratifying to the originator of the operation.

The native *Vythians* of Southern India cannot understand that the disease is caused by a protrusion of the bowels, but attribute it to a descent of wind, and term it *Unda vayvu*, literally *egg wind*, from *Unda*, *egg*, and *vayvu*, wind or vital air; others term it *Pudukuvai* or testicle pain. It is evident from the treatment that they are quite at sea as to the etiology of the disease. One remedy consists in piercing the concha of the ear on the hernial side with a red hot iron to brace the nerves of the part, which they believe have become loosened and thus produced the disease. Others again fly to the potential panacea of actual cautery to the part; and others, attributing the disease to the mal-influence of some deity, suggest propitiatory offerings to appease the offended Divinity, and this is the surgical knowledge still possessed by our native brethren of the healing art. Here is a case to the point.

A native named Thaperoomal, of the Weaver caste, presented himself at the Civil Dispensary, seeking relief for a troublesome, reducible scrotal hernia, for which he said he had tried various native remedies without being

relieved. He had undergone perforation of the ear, and in the left concha was an opening large enough to allow of the free passage of my little finger, and along the external abdominal ring were scars of actual cautery. As the patient was extremely anxious to have something done after all the torture he had undergone, an operation was proposed, and as the patient acquiesced, after a purgative and a day's rest, he was brought under the influence of chloroform, and a modification of Gerdy's operation, if it may be so called, was performed. Thus the scrotum was pushed up as high as possible into the abdominal canal by the forefinger of the left hand, and there it was transfixed by a stitch, and a wooden plug was passed into the invaginated scrotum, and this was again supported by a firm pad and bandage so as to keep the parts in apposition and prevent any strain occurring to the ligature. The ligature cut its way out of its own accord on the 6th day, and both the ligature points in the groin having united, discharged a little healthy pus. The plug was maintained for about 10 days and the invaginated parts were smeared over with liquor ammonia—in a fortnight the parts had healed and the union appeared firm and strong. The patient was up and about on the 10th day, there were no signs of the return of the hernia. As the patient was anxious to return to his village, a truss was fitted to the part, and he was instructed to wear the truss constantly for some time, but in a fortnight he removed it and tried various experiments in the way of running, jumping, &c., and finding that the hernia did not return he brought back the instrument to the institution and nothing could induce him to wear it for some time longer. He brought with him a relation suffering from the same disease, but he refused to undergo an operation. I had this man for nearly two years under observation, and then lost sight of him, during all that time the hernia never returned, and the patient continued well and the parts properly consolidated.

The following case of Hernia in which an operation was called for, and the patient was carried away by an attack of diarrhoea, may prove interesting.

HERNIA STRANGULATA.

Arnachullum Moodelly, *Æt.* 55, convicted prisoner, sentenced 4 years. Length of confinement, 1 year and 5 months.

28th April 1862.—Admitted at 7 A. M. this morning with

strangulated inguinal hernia of right side. The patient has suffered from a troublesome reducible hernia for nearly 5 years: as he was constantly coming into hospital with symptoms of incarceration of the bowels and obtaining relief by treatment, a modification of Wood's operation was performed on the 15th July 1861 with apparent success at first, but, on the 3rd of August last, it was found that the hernia returned, and the patient continued to come under treatment with symptoms of strangulation, obtaining relief by the taxis or the administration of a warm turpentine enema, aperients, &c.

On admission the patient stated that the gut came down at 3 P. M. last evening, and that he suffered much all night from pain. The scrotal tumour is as large as a good sized fist, tense, and painful about the neck to the touch. Pulse small and frequent; skin cold; eyes sunk; countenance expressive of anxiety, and exhaustion. Bowels constipated.

The usual remedies were tried without effect, and at 2 P. M. he was found greatly exhausted, and it was decided that the operation should be performed without further delay. The patient was placed under chloroform, and the taxis tried again; failing in this, the operation was proceeded with. The usual incision was made, and on opening the sac, nearly 8 oz. of bloody serum escaped, a large knuckle of small intestine formed the mass of the swelling, the upper portion of a dark claret colour, and the gut itself in an extreme state of congestion. Although much discolored and rough on its surface, it was neither *brittle* nor *emphysematous*. The intestine seemed completely shut off from the abdomen by a very tight stricture which was divided with some difficulty, and notwithstanding the unfavourable appearance of the intestine, it was returned into the abdomen. The edges of the wound were brought together by interrupted suture, pad, and bandage, and as the patient appeared much exhausted, 3 i of arrack with water was given him, and he was put to bed.

8 P. M.—Patient doing well, complains of some pain in the abdomen. Pulse 90, frequent; skin warm. Two loose feculent watery evacuations since operation.

R. Hydrarg. Chlorid. gr. v.
Opii. gr. i, ft. pil. H.S.S.

29th.—Passed a good night, some slight tenderness about the abdomen; which is slightly tympanitic. Pulse 96; skin

warm ; tongue furred, but moist ; one watery evacuation this morning.

Nil. To have congee diet. Appl. Fetus to abdomen.

Vesp. 6 P. M.—Has some heat of skin since 11 A. M. Abdomen tender and tympanitic ; pulse 98, quick ; skin dry ; tongue furred and dry.

℞ Hydr. Chlorid. gr. v.

Opii. gr. i. ft. pil. H.S.S.

Mist. Diaphoretic ʒi. every 3 hours.

Turpentine stupe to abdomen.

30th.—Heat of skin left him at 8 P. M. Had a good night's sleep, and is looking better and expresses himself so. Abdomen less tender and free of tympanitis. Pulse 84, small and soft ; skin cool ; tongue dry and slightly furred ; bowels moved during the night.

℞ Hyr. Chlorid gr. ii.

Ant. Pot. Tart gr. ʒ.

Opii. gr. ss. ft. pil. terindie.

Cont. Mist. Diaphoretic if necessary.

Rept. turpentine stupe two or three times in the day.

1st May 1862.—Doing well, abdomen free of tenderness, but slightly tympanitic. Bowels confined since last report. The dressings were removed, the greater part of wound healed by first intention. The sutures were cut out and adhesive strappings with bandage, &c., applied.

℞ Ol. Ricini ʒi.

Pulv. Aromat Conf. ʒ i. misce.

to be taken immediately. Omit pil.

Vesp.—Has had fever since 1 P. M. ; abdomen tympanitic ; complains of borborygmi ; bowels moved twice by the oil. The patient now had periodical attacks of fever, the wound opened afresh, and the adherent sac which had given cover to the hernia now became sloughy, and on the 13th he was seized with diarrhoea, and notwithstanding the free use of tonics, astringents, wine and nutrients, he sank exhausted on the 21st of May, on the 25th day after the operation.

POST MORTEM EXAMINATION.

Head.—Not examined.

Chest.—Lungs and heart healthy.

Abdomen.—On opening this cavity, the whole viscera were found perfectly blanched and distended with flatus.

The lower portion of the ileum, about 9 inches from the cœcum, where the gut had strangulated, was discolored black on its upper surface, but the structure of the gut was found slightly contracted and thickened. On opening the abdominal ring, the parts were found discolored, and the communication between the wound and the abdominal cavity open. The slough that formed in the wound was the remains of the hernial sac; excepting this there was no other cause of disease to be found.

Remarks.—It is said by surgical authorities that in old standing cases of scrotal hernia, when incarceration or strangulation takes place, the operation could well be deferred for a considerable time, much more so than in acute cases. In the above case the patient had only been about seven hours under treatment, but if his statements are to be believed, he must have been ill at least 23 hours prior to treatment.

When first admitted into the jail, he had in use a brass made native truss, this not answering the purpose, he had an hospital truss fitted on; but as he was constantly coming into hospital, complaining of symptoms of incarceration, a slight modification of Wood's operation was performed, but it failed, not from any fault in the operation, but from want of the proper instruments. However, the size of the hernia was reduced considerably, he was now fitted with a truss and sent out, but he was in the habit of removing the truss and making himself ill to avoid work, and must have teased himself on the last occasion when brought in sick. There was every hope of his making a good recovery, but the gut seems to have become paralysed from the tightness of the stricture, and notwithstanding all treatment, it did not recover its normal tone; he sank from exhaustion caused by the diarrhoea. Unfortunately I was absent at the time of his death, and the *post-mortem* examination was made by 1st Dresser Appavoo, No. 362, in the presence of 1st Dresser Rungasawmy and 2nd Dresser Moonesawmy.

No. 6.—*A Case of Fatty Degeneration of the Heart and Kidneys, complicated with disease of the mitral valve.*

By J. SHORTT, Esq., M.D.

NARRAINSAWMY, *Æt.* 50, convicted prisoner, sentenced to 7 years' imprisonment, of the Korava caste, was received by transfer with the following statement.

Previous History.—"This man was admitted into the jail hospital on the 16th November last (1860) suffering from general debility with œdema of the lower extremities. He has lost, since his admission into jail in February last, nearly a stone and a half in weight, although for some time free from symptoms of œdema, he has latterly gained but little in strength, notwithstanding the use of a liberal diet, and he suffers also from mental depression.

Recommended to proceed to Chingleput for change of air."

Patient's Statement.—The patient states that for the last three months he has been more or less laid up with fever of an intermittent character. He had also observed of late some degree of puffiness about his face, which was succeeded by œdema of the ankles and feet.

Present condition.—He complains of a general feeling of oppression and uneasiness at the præcordia with a tendency to syncope. There is irregular action of the heart, extreme anxiety, pale and shrunken features, dyspnœa, an inability to lie on either side, puffiness of the face, with an anxious expression and slight knitting of the brows, and the countenance pale and suffused. Œdema of the feet and ankles. These symptoms being greatly increased on the slightest exertion. The tongue is furred; the bowels costive; pulse small, weak and intermittent, being scarcely perceptible at the wrist.

Physical Signs.—There is dullness on percussion between the 1st and 7th ribs, extending into the axilla and embracing the lower and lateral surfaces of the left side of the chest; the dulness being more marked over the mammary and inferior mammary regions.

The impulse of the heart is somewhat increased in force, palpitating with some amount of violence against the parietes of the chest. On auscultation there is a blowing sound distinctly heard in the right sub-clavian triangle, leaving no trace of its existence below the clavicle. A peculiar sawing murmur of some degree of harshness in its tone is distinctly heard below the nipple and traceable for some distance into the axilla.

Influence on Respiration.—Dyspnœa, the patient cannot breathe unless in the recumbent position, has foul breath, and a dry cough, which gives him trouble at night.

Influence on Cerebral Functions.—Countenance expressive of marked anxiety, is drowsy, and sleeps little, from this he wakes with increased difficulty of breathing.

9th.—The patient has been purged frequently at night. He complains of debility; pulse barely perceptible at the wrist; tongue still foul.

10th.—The diarrhœa still continues; the stools are frequent, small, and of a watery consistence. The face is more puffy. The œdema has left the lid of the right eye and attacked the left; tongue foul; skin cold.

11th.—The patient is very weak, his bowels are relaxed, is drowsy during the greater part of the day. Continued much in the same state, gradually became comatose, and eventually expired at 5-30 P. M. of the 16th January 1861.

Autopsy, 13 hours after death. Body poorly nourished; face pale, shrivelled and puffy; abdomen sunk. A very small quantity of adipose tissue was found under the skin.

Head.—Not examined.

Thorax.—The left lung was firmly adherent by its posterior surface to the spinal column and by its anterior margin to the ribs. *Pericardium and diaphragm.*—The division between the two lower lobes of the same lung being destroyed by extensive adhesion, there was hypostatic congestion of posterior lobes. The costal pleura was somewhat thickened and adherent to the ribs. Heart of natural size, soft, flabby, friable, and covered with fat. A small polypus with some organised fatty membrane in the left ventricle. Right ventricle empty. The free margin of the mitral valve studded with vegetations and small cartilaginous nodules, which prevent accurate adaptation of the edges to each other. Heart weighed 11 oz., devoid of pericardium.

Abdomen.—Stomach contains some watery fluid with thickening of its pyloric extremity. Omentum adherent to diaphragm, thus fixing the transverse colon. Liver slightly enlarged, friable, and of a boiled appearance, weighing 2 lbs. 5 oz.; spleen normal, weighing 10 oz.; pancreas indurated and extremely nodulated, adherent to the pyloric extremity of the stomach.

Kidneys.—Left kidney larger than right, the cortical portion of right somewhat pale and atrophied. Left kidney of a pale straw colour, densely infiltrated with serum and fatty degeneration of its tissues; right kidney 3½ oz.; left kidney 4½ oz.; bladder normal, containing about 4 oz. of urine.

No. 11.—*A Case of Traumatic Stricture of the Urethra cured by Urethrotomy.* By HENRY C. BRODRICK, M.D.,
Assistant Surgeon, 1st Corps, Central India Horse.

JYE SINGH, Thakoor by caste, Cultivator, aged 35 years; of spare habit and careworn aspect, was admitted for treatment in Private Dispensary, Augur, suffering from severe stricture of the bulb of the urethra, April 10th 1864.

In September 1863 this man, whilst watching his crops from a "muchan," fell and impaled himself on a stake.

The point of the stake wounded the urethra, passing to it through the scrotum; severe hemorrhage ensued and recurred at intervals for three or four days after which it stopped, and presently some friend of his stitched up the wound in the scrotum for him.

One month after the receipt of the injury he came into Augur for treatment, at which time all his urine passed through the wound which had never healed.

Dr. Beaumont operated upon him and entirely restored the continuity of the urethra, which was maintained of due calibre by the systematic passing of catheters at regular intervals.

Presently he used to attend every four days for catheterization, but soon grew careless, and at last ceased to attend at all.

In March 1864 he came into Augur and placed himself under my treatment, Dr. Beaumont having, in the meantime, been transferred to Indore, and I catheterized him with some difficulty, the stricture having become very tight.

He attended very irregularly, having his farm to look after, which lay some 12 miles from the Cantonment; on this account I lent him a catheter to take away with him, and he was shown how to introduce it.

In April the stricture was so very difficult to pass through, and the man's sufferings were so intolerable, and his importunity so great, that I consented to operate upon him.

**Operation, April 18th.*—A catheter was passed with very great difficulty, and the man was placed under the influence of chloroform.

* I was kindly assisted in this by Edward Sexton, Esq., M.D., of the Bombay Medical Department.

I then cut down on the catheter, keeping accurately to the mesial line, and hitting the instrument by careful strokes and scratches of the knife. The structures cut through were quite cartilaginous in density, and this density increased as the stricture, which was in the bulbous portion, was neared.

The catheter was now removed and a director passed upwards and downwards, the tube and all the structures involved in the stricture were divided on it to a little beyond the distal and proximal limits of the obstruction.

Even then there was considerable difficulty found in passing a No. 5 catheter into the bladder, great obstruction being found about the prostate, which had no doubt been drilled over and over again in fresh places by the patient during self-catheterism.

This No. 5 was bound in the bladder and kept there for 12 days, being constantly washed out by injections of warm water, which gave the patient great relief: at the expiry of this time the presence of the instrument caused so much suffering about the prostate that I removed it.

After this it was passed twice a day and kept in situ from a quarter to half an hour.

Morphia at night, opiate suppositories, *Uva Ursi* with alkalis were given during the period of treatment, and, later on, the Tinct. Ferri Sesquichloridi, which proved very beneficial in subduing the vesical and prostatic irritation.

On May 7th No. 7 was passed very easily, there being only momentary obstruction in the site of the old stricture. On the 9th of May the wound being soundly healed he was sent to his home and supplied with No. 7 elastic catheter, which he was instructed to pass twice a day.

On May 25th he presented himself wonderfully changed for the better, and before me passed his urine voluntarily in a full stream, he had passed the instrument twice a day until 3 days back, when he confessed he had discontinued its use, but had worn the instrument round his neck and made "pooja" to it!

I passed No. 7 at once, and with entire ease, there being no obstruction to all appearances.

He was emphatically warned against neglecting the use of the catheter, and he promised, on leaving, to pass it every day as long as he lived.

I have not seen him since up to this date (August 10th), but several of his neighbours have been to my hospital for treatment and they have always said that he kept quite well.

REMARKS.—This was an unpromising case, the man had been operated on before and had relapsed. Owing to his own carelessness he was miserably thin and of an anxious and fretful disposition. Moreover, I had seen so many relapses after urethrotomy, in one of which a patient had been cut twice by Mr. Syme, and relapsed for a second time, and died, not *from* (but *with*) an almost impervious stricture that I had no great faith in the undertaking.

I should have much preferred “bursting” the stricture had Holt’s apparatus been procurable, for I am sure Holt’s method, which is a violent subcutaneous urethrotomy with a blunt instrument, and is extremely safe and easy, must be preferable to the operation I have described above.

But in India we must make the best of the few venerable instruments that Government allows us, unless we ruin ourselves in Messrs. Weiss’ and Coxeter’s shops by purchasing *apparatus de luxe* at our own expense, a noble sacrifice that will become rarer and more rare now-a-days.

METEOROLOGICAL RESULTS from the Madras Observatory
Register, for the month of January 1864.

1864.	Barometer reduced to 32°	Standard Thermometer.				Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
		Observed Extremes.		Daily Means.			Prevailing Direction.	Daily Velocity.		
		Maxim.	Minim.	Dry.	Wet.					
Inches.	°	°	°	°	per cent.		Mls.	Ina.		
1st	29.972	78.5	65.2	71.8	67.1	*	N.E by N.	80	.....	Chiefly fine.
2nd	.970	78.1	65.3	71.9	67.5	*	N. E.	73	.....	Fine.
3rd	.977	78.5	65.6	73.7	67.7	*	N.E by N.	95	.....	Fine, with flying clouds
4th	.973	80.0	67.0	74.8	68.2	72	N. E.	111	.....	Flying clouds.
5th	.958	80.6	67.0	75.0	70.0	79	N. E.	144	.....	Frequently overcast
6th	.990	80.4	70.2	76.2	69.7	73	N. E.	192	.....	Flying clouds.
7th	30.012	79.7	73.8	76.1	68.6	69	N. E.	211	.....	Do.
8th	.015	79.6	73.1	75.5	68.2	70	N. E.	205	.....	Chiefly clouds.
9th	.038	78.6	74.1	75.3	66.7	65	N.E by N.	217	.....	Overcast.
10th	.031	78.8	71.0	74.0	67.5	72	N. N. E.	176	.....	Flying clouds.
11th	.009	79.4	67.6	73.6	66.5	70	N. N. E.	165	.....	Nearly fine.
12th	.025	78.8	65.5	72.5	65.3	68	N. E.	114	.....	Fine.
13th	.009	77.6	64.4	72.4	63.1	60	N.E by N.	136	.....	Light clouds.
14th	29.977	79.4	67.7	71.7	63.9	66	N. E.	84	.....	Cloudy.
15th	.943	79.6	66.6	72.5	63.7	63	N. N. E.	98	.....	Morning dull: day fine.
16th	.918	79.0	63.8	72.6	66.8	75	N. E.	84	.....	Fine.
17th	.940	80.0	65.0	72.9	67.2	75	E. N. E.	121	.....	Do.
18th	.940	78.4	64.3	72.3	66.9	76	N. E.	87	.....	Do.
19th	.963	78.6	64.6	72.8	66.6	73	N. E.	118	.....	Do.
20th	30.007	79.0	64.0	73.2	63.9	61	E. N. E.	95	.....	Do.
21st	.031	79.5	63.8	71.6	64.9	70	N. E.	82	.....	Light clouds.
22nd	.015	78.6	62.2	71.0	65.3	74	N.E by N.	97	.....	Light haze.
23rd	29.983	78.5	62.1	69.9	64.1	74	N. E.	66	.....	Fine day: cloudy night.
24th	.964	80.7	62.0	70.2	64.5	74	E.	70	.....	Light haze.
25th	.982	81.1	61.5	70.5	65.2	76	N.E. by E.	104	.....	Hazy.
26th	.987	79.3	61.6	70.8	64.0	70	N. N. E.	95	.....	Fine.
27th	.996	79.6	62.3	70.3	64.6	74	N. E.	75	....	Do.
28th	.983	78.0	61.0	70.4	64.9	75	N.E. by E.	77	.....	Hazy.
29th	30.011	78.5	62.0	70.5	65.1	75	E. by N.	68	.....	Light clouds.
30th	.001	79.4	63.6	71.7	67.3	80	E. S. E.	67	.....	Fine.
31st	.012	79.2	65.0	72.6	65.9	71	E. S. E.	78	.....	Do.

The Standard Barometer and Thermometers are read at 10 A. M., 4 P. M. and 10 P. M. and the Daily Means are obtained by the application of hourly corrections deduced from '5 years' observations. The Cistern of the Barometer is 27 feet above the level of the sea, and the Receiver of the Rain-gauge is three feet from the ground. The Wind is registered are for the current Civil-day—from midnight to midnight.

N. R. FOGSON, Government Astronomer.

* Not noted.

METEOROLOGICAL RESULTS from the Madras Observatory
Register, for the month of February, 1864.

1864.	Barometer reduced to 32°	Standard Thermometer.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
		Observed Extremes.		Daily Means.			Prevailing Direction.	Daily Velocity.		
		Maxim.	Minim.	Dry.	Wet.					
	Inches.	°	°	°	°	per cent.		Mls.	Ins.	
1st	30.067	79.8	64.7	73.7	65.9	67	N.E.byE.	94	.....	Light flying clouds.
2nd	109	79.7	65.6	73.9	66.6	69	N. E.	131	.....	Pretty fine.
3rd	105	81.0	70.8	76.0	67.8	66	N. E.	202	.....	Flying clouds.
4th	120	80.9	71.9	75.2	68.3	71	N.E.byN.	179	.....	Frequently clouded.
5th	128	80.9	67.8	74.6	69.1	76	N.E.byN.	107	.....	Flying clouds.
6th	108	80.9	66.8	74.9	68.3	72	N. E.	109	.....	Fine.
7th	103	79.8	67.0	74.9	65.8	63	N. E.	150	.....	Do.
8th	30.066	78.5	67.9	73.0	64.8	65	N. E.	118	.....	Fine after day break.
9th	058	78.9	63.7	71.8	65.1	70	N.E.byN.	105	.....	Fine.
0th	040	79.9	64.9	74.2	65.2	63	N. E.	125	.....	Do.
1th	042	79.6	66.7	74.0	65.0	62	E. N. E.	120	.....	Light clouds.
2th	072	80.2	72.4	75.8	65.2	57	E. N. E.	125	.....	Hazy.
3th	030	81.9	67.4	73.3	65.3	66	E. N. E.	87	.....	Cloudy.
4th	29.945	79.1	64.1	71.8	64.9	69	E.	66	.....	Nearly fine.
5th	882	79.5	61.4	71.1	66.4	79	S. E.byE.	76	.....	Nearly fine.
6th	857	85.4	64.0	73.5	68.9	30	S. E.	185	.....	Fine.
7th	852	83.1	68.2	76.0	71.1	79	S. S. E.	163	.....	Do.
8th	799	85.6	70.5	78.1	73.0	79	S. S. E.	186	.....	Do.
9th	787	86.7	72.7	79.1	73.0	76	S. by E.	198	.....	Do.
0th	809	84.9	73.0	79.0	72.9	76	S. S. E.	180	.....	Nearly Fine.
1st	910	84.2	73.6	78.2	73.5	80	S. E.	169	.....	Flying clouds.
2nd	962	83.3	71.8	78.0	71.7	74	S. E.	117	.....	Cloudy morning: fine day.
3rd	905	83.5	73.2	78.1	71.6	73	S. E.	107	.....	Cloudy before sunrise.
4th	849	83.3	70.9	77.7	70.6	71	S.E.byS.	139	.....	Fine.
5th	854	85.4	69.7	78.2	72.5	76	S. S. E.	165	.....	Fine with passing clouds.
6th	886	86.0	73.4	79.1	78.1	76	S. S. E.	169	.....	Fine.
7th	868	86.5	72.9	79.7	73.4	75	S. S. E.	160	.....	Do.
8th	823	88.9	73.7	80.1	74.1	76	S. S. E.	159	.....	Do.
9th	869	86.3	73.9	79.6	73.6	76	S.E.byS.	177	.....	Do.

The Standard Barometer and Thermometers are read at 10 A.M., 4 P.M., and 10 P.M.; and the Daily Means are obtained by the application of hourly corrections deduced from twenty years' observations. The Cistern of the Barometer is 27 feet above the level of the sea, and the Receiver of the Rain-gauge is three feet from the ground. The Watch and Rain registered are for the current Civil-day—from midnight to midnight.

N. R. POGSON, Government As

METEOROLOGICAL RESULTS from the *Nuairas Observatory* *Report for the month of March, 1864.*

1864	Barometer reduced to 32°	Max. & Min. Thermometer				Percentage of Humidity	Wind		Depth of Rain.	GENERAL REMARKS
		Exposure		Shade			Prevailing Direction	Daily Velocity		
		Maxim.	Minim.	Dry	Wet					
Inches.	"	"	"	"	per cent.	Miles.	Inches.			
1st	29.940	85.0	73.2	78.8	71.4	71	S. E. by S.	154	.....	Fine.
2nd	949	84.5	70.9	78.5	71.7	73	S. E.	130	.....	Cloudy morning: fine
3rd	954	83.7	71.7	76.7	70.5	74	S. E.	98	.....	Fine.
4th	973	84.0	80.1	77.8	72.1	76	S. E.	120	.....	Do.
5th	30.021	84.7	71.0	78.4	72.4	75	E. by S.	96	.....	Flying clouds.
6th	936	84.9	74.9	79.3	71.8	70	E. N. E.	143	.....	Cloudy morning: fine
7th	29.999	84.3	71.4	78.0	72.1	75	E.	97	.....	Passing clouds.
8th	952	85.9	70.2	77.9	71.4	73	E. S. E.	98	.....	Fine.
9th	982	84.2	69.7	77.7	70.7	71	E. S. E.	101	.....	Do.
10th	30.014	84.0	69.1	76.5	68.3	66	S. E. by E.	92	.....	Passing clouds.
11th	29.975	84.4	65.2	76.5	69.7	72	S. E. by E.	132	.....	Fine.
12th	952	85.3	68.0	78.0	71.1	72	S. E.	139	.....	Do.
13th	952	85.4	71.1	79.1	73.2	76	S. E.	122	.....	Flying clouds.
14th	916	86.5	71.9	79.3	73.4	76	S. E. by S.	138	.....	Light clouds.
15th	914	87.3	72.0	80.0	72.8	71	S. E.	129	.....	Fine.
16th	956	87.1	71.9	79.8	72.9	72	S. E. by S.	131	.....	Do.
17th	945	85.7	70.2	78.3	72.2	75	S. E. by S.	146	.....	Do.
18th	894	88.0	69.0	79.5	73.0	74	S. S. E.	162	.....	Do.
19th	891	89.6	73.2	81.4	75.0	75	S. S. E.	164	.....	Hazy clouds.
20th	924	87.8	74.0	79.8	73.7	76	S. by E.	153	.....	Fine.
21st	926	86.6	69.5	78.9	72.3	73	S. S. E.	136	.....	Do.
22d	906	87.7	69.4	79.1	73.9	78	S.	175	.....	Do.
23rd	907	87.5	71.1	79.2	73.9	78	S. by E.	153	.....	Do.
24th	916	87.6	70.7	78.9	73.6	78	S. S. E.	127	.....	Do.
25th	944	86.1	70.6	77.9	72.9	79	S. S. E.	110	.....	Do.
26th	950	87.7	70.2	80.4	74.9	78	S. S. E.	137	.....	Do.
27th	931	87.9	72.1	80.2	75.2	80	S. S. E.	141	.....	Light clouds.
28th	29.895	89.4	73.8	81.7	75.4	75	S. S. E.	180	.....	Do.
29th	29.909	91.6	75.0	81.5	75.5	76	S. S. E.	16	.....
30th	29.924	89.7	75.0	80			S. S. E.	1	.....
31st	29.911	91.1	74.9				S. E.	1	.....

The Standard Barometer and the Daily Means are twenty years' observations, and the Receiver of Rain registered are for t.

METEOROLOGICAL RESULTS *from the Madras Observatory*
Register, for the month of April 1864.

Barometer reduced to 32°	Standard Thermometer.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
	Observed Extremes.		Daily Means.			Prevailing Direction.	Daily Velocity.		
	Maxim.	Minim.	Dry.	Wet.					
Inches.	°	°	°	°	per cent.		Mls.	Ins.	
29.904	88.7	75.5	82.5	77.4	80	S. S. E.	175	.....	Light clouds.
924	89.1	76.1	82.9	76.8	77	S.E. by S.	169	.....	Do.
945	88.6	75.4	81.8	75.5	75	S. E.	131	.....	Fine.
927	87.8	72.3	80.4	73.8	74	S. E.	104	.....	Do.
908	87.7	71.1	80.6	73.6	72	S. E.	120	.....	Do.
856	88.6	72.2	81.6	75.4	75	S. by W.	141	.....	Do.
815	90.2	74.2	83.0	78.0	80	S.E. by S.	163	.....	Passing clouds.
781	90.8	78.0	84.3	78.1	76	S. S. E.	181	.....	Light clouds.
813	89.8	78.7	83.6	76.7	73	S. S. E.	155	.....	Fine day: cloudy night
845	88.8	75.0	82.2	74.9	72	S. E.	118	.....	Fine.
878	89.0	72.3	82.0	75.0	73	S. E.	106	.....	Do.
881	89.4	75.6	83.1	77.0	77	S. E.	100	.....	Do.
834	90.3	75.7	84.1	76.9	72	S. E.	131	.....	Do.
761	92.9	77.2	83.8	77.8	77	S. S. E.	159	.....	Passing clouds.
792	89.8	75.1	83.8	77.0	74	S.E. by E.	149	.....	Light clouds.
824	90.0	76.5	84.1	76.8	72	S. S. E.	121	.....	Do.
837	90.3	76.3	82.7	76.5	76	S. S. E.	99	.....	Frequently clouded.
843	89.5	75.6	83.1	75.1	70	S. E.	90	.....	Cloudy.
834	89.8	74.9	83.8	76.5	72	S. S. E.	118	.....	Passing clouds.
830	91.5	77.6	84.1	77.7	76	S. S. E.	108	.....	Nearly overcast.
833	92.0	75.6	84.2	78.2	77	S.E. by S.	122	.....	Cloudy.
828	91.1	78.4	84.7	77.7	73	E. S. E.	106	.....	Do.
864	90.6	78.7	84.3	78.8	79	S. S. E.	129	0.23	Overcast & showery—lightning.
883	90.3	77.2	84.8	77.6	73	S. by E.	121	.....	Fine after sunrise—lightning.
878	92.8	78.2	85.8	78.1	71	S. by E.	173	.....	Fine.
844	94.9	78.1	86.6	80.3	76	S.	163	.....	Do.
800	97.1	78.1	84.8	78.1	75	S.	157	.....	Cloudy.
796	97.8	78.5	87.2	78.7	69	S.	165	.....	Chiefly fine.
809	95.7	78.9	86.5	79.8	75	S.	185	.....	Light hazy clouds.
847	93.0	78.5	85.9	80.1	78	S. by E.	191	.....	Light clouds.

Standard Barometer and Thermometers are read at 10 A. M., 4 P. M., and 10 P. M.
 The Cistern of the Barometer is 27 feet above the level of the sea.
 The Rain-gauge is three feet from the ground. The Wind is recorded at civil day—from midnight to midnight.

N. R. FOGSON, *Government Astronomer.*

METEOROLOGICAL RESULTS from the Madras Observatory
Register, for the month of May, 1864.

1864.	Barometer reduced to 32°	Standard Thermometers.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
		Observed Extremes.		Daily Means.			Prevailing Direction.	Daily Velocity.		
		Maxim.	Minim.	Dry.	Wet.					
	Inches.	°	°	°	°	per cent.		Mls.	Ina.	
1st	29.861	92.4	79.9	85.4	78.2	73	S. by E.	162	.....	Light clouds.
2nd	836	91.3	79.3	85.0	78.5	76	S. by E.	135	.....	Flying clouds.
3rd	830	91.3	78.1	85.3	76.5	66	S. S. E.	119	.....	Flying clouds.
4th	840	91.7	78.1	85.2	79.0	76	S. S. E.	125	.....	Light clouds.
5th	823	92.8	77.2	85.6	79.0	75	S. S. E.	124	.....	Chiefly fine.
6th	791	94.7	78.0	86.3	78.3	71	S. S. E.	122	.....	Passing clouds: Light
7th	795	92.7	78.0	86.4	78.9	72	S. S. E.	99	.....	Fine till evening: Light
8th	820	93.1	80.8	86.0	78.5	72	S. E.	90	.....	Thunder and Lightning: Day fine.
9th	818	93.0	79.4	83.9	77.8	77	S. S. W.	117	0.03	Cloudy—a sharp passing der storm after sunset.
10th	839	92.2	76.6	85.4	77.2	69	S. E.	120	.....	Chiefly overcast—Light
11th	869	91.1	81.0	85.0	77.8	73	S. by E.	129	.....	Overcast.
12th	882	92.9	80.0	85.8	78.4	73	S. by E.	120	.....	Passing clouds.
13th	894	92.8	78.1	85.7	76.6	67	S. by E.	117	.....	Fine.
14th	877	92.1	78.3	85.8	78.4	73	S. S. E.	178	.....	Do.
15th	846	93.2	78.8	86.7	76.5	63	S. S. E.	163	.....	Passing clouds.
16th	835	92.3	79.5	86.4	78.5	71	S.	175	.....	Light clouds.
17th	840	92.7	79.1	86.4	78.4	71	S.	194	.....	Do.
18th	898	92.6	79.6	85.2	78.0	73	S. S. E.	172	.....	Passing clouds, with
19th	882	92.4	78.7	86.0	77.8	69	S.	178	.....	Chiefly fine.
20th	853	94.0	79.2	86.8	77.9	67	S.	205	.....	Hazy Lightning at
21st	802	93.7	79.2	86.0	78.3	72	S. S. E.	221	.....	Light clouds: Light
22nd	826	95.1	80.9	87.7	77.9	65	S.	264	.....	Fine.
23rd	809	97.8	80.1	87.7	79.5	70	S.	225	.....	Do.
24th	744	96.1	80.8	88.6	79.8	69	S.	255	.....	Do.
25th	711	100.3	82.4	90.4	80.3	65	S. S. W.	191	.....	Hazy clouds.
26th	709	95.1	83.6	88.0	78.8	67	S.	243	.....	Do.
27th	729	94.8	79.7	88.1	78.2	65	S.	205	.....	Passing clouds.
28th	717	96.5	79.6	88.0	79.1	68	S.	284	.....	Chiefly fine.
29th	755	94.8	80.2	87.9	76.6	60	S. S. E.	164	.....	Passing clouds.
30th	718	101.1	82.2	84.9	76.8	70	W. S. W.	181	.....	A remarkable dust storm 3 P.M. without rain and lightning afterwards.
31st	702	99.5	81.0	89.0	78.5	63	S. S. W.	217	.....	Chiefly fine.

The Standard Barometer and Thermometers are read at 10 A. M., 4 P. M. and 11 P. M. and the Daily Means are obtained by the application of hourly corrections deduced from twenty years' observations. The Cistern of the Barometer is 27 feet above the sea, and the Receiver of the Rain-gauge is three feet from the ground. The Rain registered are for the current Civil-day—from midnight to midnight.

N. R. POGSON, Government Astr.

METEOROLOGICAL RESULTS *from the Madras Observatory*
Register, for the month of June, 1864.

	Barometer reduced to 32°	Standard Thermometers.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
		Observed Extremes.		Daily means.			Prevailing Direction.	Daily Velocity.		
		Maxim.	Minim.	Dry.	Wet.					
	Inches.	°	°	°	°	per cent.		Mls.	Ins.	
st	29.705	101.8	80.2	83.0	76.3	74	S.W.byS.	228	1.29	[3 and 5 P. M.
d	.670	94.8	79.8	85.9	78.0	70	S. S. W.	208	.....	Chiefly fine.
d	.654	94.5	80.0	86.5	77.4	67	S. by S.	268	.....	Passing clouds.
h	.638	94.3	81.4	87.0	77.4	65	S.	314	.....	Cloudy.
h	.615	98.1	81.0	87.1	77.2	64	S.	220	0.03	Cloudy. Lightning at night.
h	.630	96.8	82.9	87.1	77.2	64	S. S. W.	252	.....	Cloudy.
th	.656	98.8	83.0	88.4	77.7	63	S. W.	267	.....	Flying clouds.
th	.669	95.1	85.1	88.3	77.1	61	S. W.	264	.....	Chiefly fine.
th	.696	97.1	89.2	87.4	78.8	69	S. by W.	260	.....	Cloudy.
th	.622	96.9	81.8	86.5	77.7	68	S. S. W.	258	.....	Passing clouds.
th	.582	97.8	81.7	86.7	78.1	68	S. W.	245	.....	[at night. Do. with thunder and lightning
th	.623	98.0	79.6	85.5	77.9	72	S.WbyW	285	0.36	Day fine. Moderate thunder storm between 8½ and 9½ P. M.
th	.653	96.9	77.4	84.5	78.2	76	S.WbyW	211	0.10	Cloudy.
th	.705	97.9	79.4	87.9	78.1	65	W. S. W.	214	.....	Passing clouds.
th	.724	97.7	81.9	87.4	76.5	61	W. S. W.	200	.....	Do.
th	.708	100.4	81.8	87.2	77.8	66	S. W.	220	.....	Light clouds. Fine night.
th	.683	100.3	82.3	88.5	78.3	64	W. S. W.	250	.....	Light clouds.
th	.698	95.7	82.4	87.4	77.1	63	S. S. W.	200	.....	Hazy.
th	.735	97.3	79.5	85.8	77.7	70	S. S. W.	214	.....	Cloudy. Thunder and lightning towards midnight.
th	.749	98.3	76.5	87.5	76.1	60	W. S. W.	208	0.03	Passing clouds. Shower at 12 P. M.
lat	.784	99.2	81.3	86.2	77.3	67	W.	220	0.03	Partly fine. Shower before midnight.
2d	.788	98.1	81.7	87.8	75.3	56	W. S. W.	227	0.02	Chiefly cloudy. Shower before midnight.
rd	.847	90.4	77.9	81.2	73.8	71	W.	200	0.04	Overcast. A thunder storm passed over at night.
th	.837	92.4	78.5	84.0	76.8	72	W.	169	.....	Overcast and drizzling.
th	.766	97.6	78.3	87.2	75.4	59	N W by N	177	0.00	Overcast. Shower about sunset.
th	.732	97.9	83.1	90.5	74.2	46	W.	264	.....	Overcast.
th	.751	98.8	83.2	89.5	75.7	53	W. by S.	245	.....	Chiefly overcast.
th	.780	97.5	83.7	88.4	75.4	55	S. W.	290	.....	Cloudy.
th	.796	100.3	82.5	86.8	76.2	62	S. by W.	217	.....	Do.
th	.770	99.0	81.8	86.3	76.4	64	S.	201	0.04	Passing clouds.

The Standard Barometer and Thermometers are read at 10 A.M., 4 P.M., and 10 P.M. The Daily Means are obtained by the application of hourly corrections deduced from twenty years' observations. The Cistern of the Barometer is 27 feet above the level of the sea, and the Receiver of the Rain-gauge is three feet from the ground. The Wind and Barometer are registered for the current civil day—from midnight to midnight.

N. R. POGSON, *Government Astronomer.*

METEOROLOGICAL RESULTS from the Madras Observatory
Register, for the month of July 1864.

1864.	Barometer reduced to 32°	Standard Thermometers.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS
		Observed Extremes.		Daily Means.			Prevailing Direction.	Daily Velocity.		
		Maxim.	Minim.	Dry.	Wet.					
	Inches.	°	°	°	°	per cent.		Mls.	Ins.	
1st	29·741	93·4	81·6	86·8	76·1	62	S.	171	.....	Passing clouds.
2nd	·740	98·8	79·5	86·2	76·7	65	S. by W.	239	0·03	Do. shower about 6½ p.m.
3rd	·763	99·0	79·0	86·1	77·2	67	S. by W.	221	0·44	Chiefly clouded. Rain after 9 p.m.
4th	·719	99·5	78·2	85·4	77·6	71	S. S. W.	228	0·03	Chiefly cloudy.
5th	·694	100·0	80·6	88·9	74·9	53	S.W. by S.	216	0·01	Cloudy.
6th	·630	92·3	80·9	87·2	74·1	55	W. S. W.	183	.....	Overcast.
7th	·671	95·5	82·9	85·7	74·9	61	S. W.	228	.....	Do.
8th	·662	95·8	82·2	84·5	75·9	68	S. W.	218	0·10	Do. shower at 10½ p.m.
9th	·680	93·8	78·4	84·7	76·0	68	S. W.	199	0·05	Chiefly overcast.
10th	·719	97·7	80·0	85·0	75·9	67	S.W. by S.	218	0·01	{ Overcast with fine intervals. Rain drops at 8½ p. m.
11th	·741	97·4	78·4	87·0	75·8	59	S.W. by S.	230	.....	Cloudy.
12th	·736	97·5	81·9	85·7	73·2	55	W. S. W.	261	.....	Chiefly overcast.
13th	·729	90·3	80·1	84·9	72·4	55	W. S. W.	216	.....	Overcast.
14th	·676	93·1	80·2	84·8	73·6	59	W. S. W.	247	0·01	Do.
15th	·680	92·7	77·7	79·9	74·4	78	S. W.	203	0·48	Do.
16th	·676	89·2	77·8	82·5	74·2	68	S.W. by S.	305	0·08	Do.
17th	·704	93·5	77·0	85·5	73·2	56	S.W. by W.	333	.....	Do.
18th	·681	96·5	79·8	87·6	73·6	52	S.W. by W.	325	.....	Cloudy.
19th	·684	98·7	78·8	87·6	75·3	57	W. S. W.	252	0·17	Do.
20th	·718	95·6	78·2	82·2	74·6	71	W. N. W.	220	0·14	Do.
21st	·716	97·1	78·0	88·2	74·6	54	W. S. W.	282	.....	Do.
22nd	·740	93·3	82·6	88·9	74·2	51	S. W.	283	.....	Passing clouds.
23rd	·756	99·6	81·2	90·7	74·1	46	S. W.	249	.....	Do.
24th	·779	100·2	82·8	91·4	73·1	42	W. S. W.	280	.....	Half fine.
25th	·817	93·3	82·9	90·0	73·5	46	W. S. W.	282	.....	Chiefly cloudy.
26th	·826	99·2	81·6	88·8	73·9	50	W. S. W.	264	.....	Cloudy.
27th	·805	98·4	81·0	85·8	75·3	62	S. S. W.	247	.....	Fine with passing clouds.
28th	·806	96·6	81·9	87·2	75·1	58	S. by W.	250	.....	Passing clouds.
29th	·835	96·6	75·5	82·8	75·5	72	S.E. by S.	194	0·33	Fine with passing clouds between 8 and 9 p. m.
30th	·856	92·5	75·5	81·9	76·4	78	S.W. by S.	187	0·24	Cloudy. Rain about 5½ p.m.
31st	·841	97·5	74·6	82·4	76·7	78	S. W.	200	0·08	Overcast. Light shower.

The Standard Barometer and Thermometers are read at 10 A. M., 4 P. M., and 10 P. M. and the Daily Means are obtained by the application of hourly corrections deduced from twenty years' observations. The Cistern of the Barometer is 27 feet above the sea, and the Receiver of the Rain-gauge is three feet from the ground. The observations registered are for the current civil day—from midnight to midnight.

N. R. FOGSON, Government Astronomer

METEOROLOGICAL RESULTS from the Madras Observatory
Register, for the month of August 1864.

1864.	Barometer reduced to 32°	Standard Thermometers.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
		Observed Extremes.		Daily Means.			Prevailing direction.	Daily velocity.		
		Maxim.	Minim.	Dry.	Wet.					
	Inches.	°	°	°	°	per cent.		Mls.	Ins.	
1st	29.811	90.5	75.6	81.5	75.9	78	S.W.byS.	156	0.26	Overcast. Rain at 11½ P. M.
2nd	808	90.9	75.8	80.6	76.4	83	S. W.	134	1.28	Overcast. Rain before 2½ A. M. and after 7 P. M.
3rd	826	89.5	74.1	31.0	77.4	86	S. S. W.	209	1.01	Chiefly overcast. Rain till 2 A. M. with showers at 6½ & 10½ P. M.
4th	857	91.5	74.0	80.6	76.0	82	S. S. W.	218	0.96	Chiefly overcast. Rain from 9½ to 12 P. M.
5th	799	91.6	74.5	82.7	76.7	77	S.W.byS.	189	0.01	Chiefly overcast.
6th	775	93.1	78.6	84.5	75.8	68	W. S. W.	183	.....	Passing clouds.
7th	719	94.1	78.8	86.6	75.8	62	W. by S.	247	.....	Fine with passing clouds.
8th	722	96.0	80.6	86.7	75.7	61	S. W.	241	.....	Light clouds: fine night.
9th	766	95.8	78.9	86.3	75.1	60	S. W.	230	.....	Light clouds.
10th	753	93.6	79.4	86.1	75.5	62	S. W.	240	0.37	Fine day: showery evening.
11th	749	95.6	78.7	83.7	77.3	75	S.WbyS.	215	0.03	Fine with passing clouds.
12th	737	94.1	77.8	85.7	75.3	63	W.S.W.	216	.....	Passing clouds.
13th	735	95.3	79.7	87.7	72.4	48	W.	247	.....	Do.
14th	768	96.5	80.7	86.5	74.4	58	W. S. W.	257	0.01	Do.
15th	821	96.9	79.7	84.8	75.5	66	S. W.	201	.....	Fine day, cloudy night.
16th	828	93.9	80.4	85.4	73.5	57	S.	175	.....	Fine.
17th	826	93.7	78.7	85.6	75.0	62	S.byE.	168	.....	Nearly fine.
18th	836	93.9	79.1	85.8	76.9	67	S. by E.	151	.....	Light clouds,
19th	833	93.5	80.1	86.8	76.8	64	S. by W.	166	.....	Do.
20th	833	92.7	78.9	84.5	76.4	70	S. by W.	146	.....	Cloudy.
21st	839	92.9	77.8	84.7	77.1	71	S.	145	.....	Light clouds.
22nd	811	94.0	77.5	84.2	76.9	72	S.	132	.....	Chiefly fine.
23rd	793	92.7	75.5	85.1	76.9	69	S.	154	.....	Fine.
24th	779	90.8	79.6	84.8	78.4	76	S. E.	112	0.04	Fine with passing clouds.
25th	758	92.3	75.4	83.8	77.2	75	S.	219	0.01	Passing clouds.
26th	746	93.6	78.7	85.3	77.1	69	S. by E.	172	.....	Fine.
27th	735	92.2	77.1	81.1	76.5	82	S. S. W.	146	0.99	Cloudy. Thunderstorm from 1 to 2 P. M.
28th	773	79.5	74.2	76.2	73.2	87	W.	128	1.55	Heavy rain at 4½ A. M., overcast and showery all day.
29th	754	78.2	73.9	76.5	73.5	87	W. S.W.	195	0.79	Overcast. Rain about noon.
30th	746	86.6	74.5	80.3	74.9	78	W. S. W.	170	0.01	Cloudy. Shower at 4 P. M.
31st	789	86.5	76.7	82.2	75.6	74	W. S. W.	160	.....	Cloudy.

The Standard Barometer and Thermometers are read at 10 A.M., 4 P.M., and 10 P.M.; the Daily Means are obtained by the application of hourly corrections deduced from twenty years' observations. The Cistern of the Barometer is 27 feet above the level of the sea, and the Receiver of the Rain-gauge is three feet from the ground. The Wind Rain registered are for the current Civil-day—from midnight to midnight.

N. R. POGSON, *Government Astronomer.*

METEOROLOGICAL RESULTS from the Madras Observatory
Register, for the month of September 1864.

1864.	Barometer reduced to 32°	Standard Thermometers.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
		Observed Extremes.		Daily Means.			Prevailing Direction.	Daily Velocity.		
		Maxim.	Minim.	Dry.	Wet.					
	Inches.	°	°	°	°	per cent.		Mls.	Ins.	
1st	29.759	89.2	77.6	83.4	75.3	70	W. by S.	222	.....	Overcast.
2nd	776	91.9	79.0	83.6	75.6	70	W. S. W.	193	0.02	Passing clouds. Shower at 6 P.M., thunder and lightning towards midnight.
3rd	799	93.1	79.3	83.5	75.8	71	S.W by W	207	0.07	Passing clouds. Thunder at lightning before midnight.
4th	806	95.2	78.8	83.4	77.2	76	S.W by S.	212	.....	Cloudy. Rain between 3 & 5 P.M.
5th	792	92.3	77.8	79.7	75.3	82	S. W.	224	0.21	Chiefly overcast.
6th	754	95.1	77.7	82.8	76.7	77	S. S. W.	194	.....	Chiefly overcast. Shower.
7th	755	90.8	77.7	81.4	77.0	82	S.W by S.	195	0.16	Overcast.
8th	765	89.3	77.7	83.3	75.9	72	W. S. W.	159	.....	Cloudy.
9th	778	92.1	78.0	84.2	75.3	67	W.	192	.....	Passing clouds.
10th	809	92.2	78.5	84.9	75.3	65	W. S. W.	228	.....	Fine with passing clouds.
11th	839	92.5	78.9	83.6	75.9	71	S. by W.	206	.....	Flying clouds.
12th	833	93.1	78.8	85.0	76.0	67	S.	152	.....	Chiefly fine.
13th	811	94.9	78.9	85.1	75.9	66	S. by W.	175	.....	Fine.
14th	807	93.3	78.5	85.0	75.9	67	S.	158	.....	Passing clouds.
15th	819	93.6	78.7	84.5	76.8	71	S. by W.	184	.....	Do.
16th	808	94.2	78.2	84.5	76.5	70	S. S. E.	133	.....	Chiefly overcast.
17th	814	93.2	78.4	84.6	74.6	63	S. W.	149	.....	Do.
18th	836	94.0	78.7	84.7	77.9	75	S. S. W.	215	.....	Passing clouds. Shower at 1 P.M.
19th	788	94.8	78.9	84.8	77.3	71	S. by W.	256	0.12	Passing clouds.
20th	764	95.0	77.2	84.1	77.1	78	S. S. W.	224	.....	Cloudy.
21st	808	93.9	78.7	85.3	77.0	69	S.	176	.....	Chiefly overcast.
22nd	833	92.6	80.6	86.4	75.6	62	S.W by W	122	.....	Flying clouds.
23rd	825	94.4	80.3	83.1	76.2	73	NW by N	103	.....	Overcast. Rain about 6 A.M.
24th	835	85.6	79.6	82.2	77.6	82	NW by W	87	0.24	Cloudy. Shower about 9 A.M.
25th	870	89.3	78.6	82.5	77.3	79	{ W.S.W } { E. by N }	71	0.01	Fine with passing clouds.
26th	922	88.3	77.4	83.3	76.0	72	E.	93	.....	Chiefly fine.
27th	897	89.5	75.4	83.5	75.9	71	E. S. E.	81	.....	Light clouds.
28th	864	90.3	74.9	83.3	75.3	70	E. S. E.	109	.....	Flying clouds.
29th	872	91.4	76.7	84.9	77.0	70	S.E. by E.	117	.....	Do.
30th	886	92.3	79.6	84.9	77.0	70	E. S. E.	82	.....

The Standard Barometer and Thermometers are read at 10 A.M., 4 P.M., and 10 P.M. and the Daily Means are obtained by the application of hourly corrections deduced from twenty years' observations. The Cistern of the Barometer is 27 feet above the level of sea, and the Receiver of the Rain-gauge is three feet from the ground. The Wind entered are for the current Civil-day—from midnight to midnight.

N. R. POGSON, *Government Astronomer*

METEOROLOGICAL RESULTS from the Madras Observatory
Register, for the month of October, 1864.

Barometer reduced to 32° Inches.	Standard Thermometers.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
	Observed Extremes.		Daily means.			Prevailing direction.	Daily Velocity.		
	Maxim.	Minim.	Dry.	Wet.					
°	°	°	°	per cent.		Mls.	Ins.		
29.889	91.1	77.8	84.8	77.9	74	E. S. E.	92	.....	Fine with light clouds.
847	88.5	75.7	82.8	76.2	74	N. by E.	179	0.48	Heavy passing clouds.
813	87.5	76.5	82.6	77.6	80	N. N. W.	149	0.42	Fine, with occasional showers
812	88.7	76.1	82.8	76.5	76	N.E. by E.	89	.....	Passing clouds.
825	91.5	75.8	82.0	74.9	69	S.E. by E.	94	.....	Fine.
866	92.9	75.5	83.0	71.6	58	N. E.	103	.....	Chiefly fine.
854	92.4	78.0	84.9	72.4	55	N. N. E.	177	.....	Dull morning : fine day.
855	90.4	76.1	84.2	76.1	70	N.E. by N.	166	.....	Fine.
847	90.0	75.0	84.4	76.5	70	N.E. by N.	186	.....	Fine, with passing clouds.
867	91.0	77.5	81.4	74.9	74	N. N. E.	128	.....	Chiefly overcast.
875	83.7	76.2	79.5	74.4	80	N. by W.	146	.....	Overcast.
883	86.5	76.5	78.5	75.8	88	N. N. W.	119	0.07	Overcast, with light showers.
892	90.6	73.5	81.8	74.5	72	N. by E.	176	.....	Passing clouds.
921	88.7	76.3	81.8	74.9	73	N. by W.	190	.....	Do.
929	87.6	75.6	82.1	76.5	78	N. by E.	217	.....	Frequently overcast.
938	83.6	76.6	79.6	76.3	86	N. by E.	93	1.68	Heavy clouds with fine intervals. Showers at 8½ and 10½ A. M. Heavy rain at 11½ A. M.
933	85.7	75.0	77.3	75.0	90	N. E.	74	0.14	Cloudy and threatening.
891	78.8	72.9	75.3	73.7	93	N.	218	4.09	Continuous rain : heaviest about 8½ A. M.
738	81.9	73.5	76.7	75.5	95	N.E. by N.	431	5.88	Rain : heaviest at 3 & 8 A. M.
760	76.0	71.8	73.6	71.3	90	W. N. W.	265	0.90	Overcast. Rain until noon.
853	85.6	72.5	79.5	77.0	90	S W by W	98	.....	Overcast.
921	87.5	74.7	79.9	73.7	75	N W by W	76	.....	Hazy clouds.
926	87.5	72.9	80.0	74.7	79	N. N. W.	88	.....	Chiefly fine.
923	89.0	74.2	79.1	76.2	87	S. by E.	75	.....	Hazy clouds.
938	88.3	73.3	79.9	75.3	81	S. by W.	81	.....	Fine.
980	85.6	73.0	79.0	73.7	78	S.E. by E.	70	.....	Do.
982	85.3	72.8	80.1	73.6	74	N. E.	126	.....	Do.
980	84.6	73.8	79.4	71.3	68	N. N. E.	139	.....	Light clouds.
980	84.0	72.1	79.7	68.8	58	N. N. E.	207	.....	Chiefly fine.
951	84.1	68.8	76.9	70.1	72	N.	161	.....	Light clouds.
888	85.8	68.5	78.3	68.3	61	N. by W.	172	.....	Fine.

The Standard Barometer and Thermometers are read at 10 A.M., 4 P.M., and 10 P.M.; the Daily Means are obtained by the application of hourly corrections deduced from 17 years' observations. The Cistern of the Barometer is 27 feet above the level of the land and the Receiver of the Rain-gauge is three feet from the ground. The Wind and registered are for the current civil day—from midnight to midnight.

METEOROLOGICAL RESULTS from the Madras Observatory
Register, for the month of November, 1864.

1864.	Barometer reduced to 32°.	Standard Thermometers.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
		Observed Extremes.		Daily Means.			Prevailing direction.	Daily Velocity.		
		Maxim.	Minim.	Dry.	Wet.					
	Inches.	°	°	°	°	per cent.		Mls.	Ins.	
1st	29.808	88.9	73.6	80.6	70.7	62	W. by S.	142	.....	Cloudy.
2nd	.887	87.9	80.5	82.1	76.5	78	S. by E.	363	....	Do.
3rd	.983	86.5	77.9	81.6	76.2	78	S. E.	169	.....	Fine, with Passing clouds.
4th	30.001	84.4	74.3	80.0	75.3	81	E. N. E.	214	0.63	Cloudy.
5th	.022	84.1	76.2	79.3	73.9	78	N. E.	203	0.01	Passing clouds.
6th	.033	85.0	75.1	79.4	72.6	73	N.E. by N.	172	.....	Do.
7th	29.989	82.8	73.9	77.9	71.2	73	N. E.	138	.....	Do.
8th	.973	83.5	70.9	78.8	73.6	78	N. E. by N.	165	.....	Do.
9th	30.011	83.7	73.6	79.4	73.3	76	N. E.	188	.....	Cloudy. [P.M.]
10th	.037	83.6	77.2	79.4	73.8	77	N. E.	257	0.21	Cloudy. Showers at 3 and 5
11th	.058	83.6	77.1	79.8	73.6	75	N. E.	256	0.08	Cloudy. Shower at 7 P. M.
12th	.022	84.2	77.2	80.2	72.9	71	N.E. by N.	234	0.01	Cloudy, Light shower at 1 P.M.
13th	.022	82.1	74.7	77.7	72.5	78	N. by E.	131	0.51	Cloudy. Showers before 1 A. M., and at 0½ and 6 P. M.
14th	29.980	82.8	78.0	75.3	72.1	86	N.E. by N.	172	0.92	Rain at 0½ A. M., and at 7½ P. M. Heavy rain from 11 to 11½ P.M.
15th	.946	81.7	71.9	75.5	72.2	86	N. by E.	153	.....	Heavy Clouds.
16th	.957	83.1	72.1	76.8	73.4	85	N.	143	0.47	Frequent showers: heaviest at 4 A.M. and 1 P.M.
17th	.946	82.3	74.6	78.6	73.3	78	N.	290	.....	Chiefly overcast.
* 18	.864	76.0	70.0	72.1	71.9	99	N. by W.	416	9.35	Showers at 3 A. M. Heavy rain from 7½ A. M. to 11½ P.M.
19th	.908	80.2	70.6	74.4	72.4	91	S.E. by E.	354	0.10	Overcast. Showers at 10 A. M. and 6 P.M.
20th	.996	82.8	72.0	76.7	74.5	90	S. by E.	67	0.07	Flying Clouds, and light showers.
21st	30.000	82.7	73.8	77.7	74.6	87	E.	112	0.28	Passing clouds, rain at 9½ P.M.
22nd	.021	81.9	75.8	78.5	72.7	76	N. E.	237	.....	Light flying clouds.
23rd	.034	81.8	75.6	78.1	70.7	70	N. N. E.	243	.....	Do.
24th	29.999	81.0	71.2	76.8	70.8	77	N. N. E.	184	.....	Passing clouds.
25th	.981	80.1	70.1	74.7	69.0	75	N.	192	.....	Do. [P.M.]
26th	.954	79.1	69.7	74.5	70.5	83	N. N. W.	238	0.29	Cloudy, rain from 8½ to 9½.
27th	.922	79.0	72.0	73.6	72.1	93	N. N. W.	234	1.24	Cloudy and rainy: heaviest at 8½ A.M. & from 9 to 10 P. M.
28th	.983	75.4	72.8	73.6	71.6	91	E. by N.	280	4.31	Continuous rain until 9 P.M., heaviest from 4 to 7 A.M.
29th	30.018	82.3	73.2	77.6	73.5	83	N.E. by E.	224	.....	Chiefly overcast.
30th	.024	81.9	73.4	77.8	74.1	84	N.E. by E.	163	.....	Passing clouds.

The Standard Barometer and Thermometers are read at 10 A.M., 4 P.M., and 10 P.M.; and the Daily Means are obtained by the application of hourly corrections deduced from twenty years' observation. The Cistern of the Barometer is 27 feet above the level of the sea, and the Receiver of the Rain-gauge is three feet from the ground. The Wind and Rain registered are for the current civil day—from midnight to midnight.

N. R. FOGSON, Government Astronomer.

* The Rain-fall on Friday 18th was unusually heavy for Madras, and has only been exceeded on 8 days since the year 1822. The wind rose when the rain ceased, and attained its maximum velocity of 28 miles per hour, or 4 lbs. pressure per square foot, between 2 and 3 A.M. on the 19th instant.

METEOROLOGICAL RESULTS from the Madras Observatory
Register, for the month of December, 1864.

1002.	Barometer reduced to 32°	Standard Thermometers.				Percentage of Humidity.	Wind.		Depth of Rain.	GENERAL REMARKS.
		Observed Extremes.		Daily Means.			Prevailing direction.	Daily velocity.		
		Maxim.	Minim.	Dry.	Wet.					
	Inches.	°	°	°	°	per cent.		Mls.	Ins.	
st	30·017	82·5	74·4	76·8	72·9	83	N. E.	147	.....	Passing clouds.
nd	29·988	81·3	72·6	75·9	72·3	85	N. N. E.	81	.....	do.
rd	·995	82·1	71·7	77·4	73·5	83	N. by E.	152	.....	do.
h	30·003	80·2	74·2	77·0	71·9	79	N.E.by N	264	0·66	Chiefly overcast and showery, heaviest just before 8 A. M.
h	29·982	81·1	73·3	76·8	71·7	79	N. N. E.	307	0·06	Overcast. Showers at 4½ and 5½ A. M.
h	·998	80·4	73·3	75·6	72·4	86	N. by E.	200	0·69	Overcast. Rain between 1 and 5 P.M.
h	·992	81·6	72·6	77·9	74·3	85	N. N. E.	289	0·07	Flying clouds. Shower at 8½ P.M.
h	·983	82·2	75·2	78·4	73·8	81	N.E.by N	321	0·11	Flying. Showers at 1½, 4 and 4½ A.M.
h	·988	81·9	75·3	77·7	70·7	71	N. N. E.	267	.....	Flying clouds.
h	·980	80·1	70·6	76·1	68·5	69	N. by E.	219	.....	Fine with passing clouds.
h	·975	80·4	68·8	74·6	69·3	77	N.	152	.....	Chiefly fine.
h	·990	80·8	68·9	75·2	70·1	79	N. by E.	161	.....	do.
h	·989	79·8	70·1	75·5	69·3	74	N. by E.	196	.....	Flying clouds.
h	·996	80·1	72·2	75·2	67·9	70	N. N. E.	167	.....	Chiefly fine.
h	·984	80·0	67·9	75·1	69·1	74	N.by E.	151	.....	do.
h	·992	79·9	68·6	74·7	69·2	76	N, by E.	172	.....	Hazy clouds.
h	·992	80·2	69·8	75·7	69·9	76	N.	219	.....	do.
h	30·006	81·1	70·6	74·8	69·3	76	N. N. E.	176	.....	Hazy and dull.
h	·005	80·4	69·6	75·8	67·5	66	N. N. E.	167	.....	Flying clouds.
h	·011	81·3	69·9	74·2	67·4	71	N.E.by E.	131	.....	Chiefly cloudy.
h	29·998	80·7	68·7	73·9	69·1	79	N.E.by N.	144	.....	Light flying clouds.
h	30·004	81·0	69·3	75·3	70·2	79	N. by E.	184	.....	Fine with passing clouds.
h	·015	81·1	69·7	76·5	70·7	76	N. by E.	249	.....	Passing clouds.
h	·065	80·8	71·0	77·1	70·6	73	N. by E.	257	0·10	Hazy; with frequent clouds and rain at 11½ P. M.
h	·077	81·4	73·4	77·1	72·8	82	N.E.by N	344	0·74	Chiefly cloudy! Rain from 3 to 4½ A.M., and shower about 3 P.M.

The Standard Barometer and Thermometers are read at 10 A.M., 4 P.M., and 10 P.M. The Daily Means are obtained by the application of hourly corrections, deduced from years' observations. The Cistern of the Barometer is 27 feet above the level of the Receiver of the Rain-gauge is three feet from the ground. The Wind and registered are for the current civil-day—from midnight to midnight.

PART IV.

MEDICAL INTELLIGENCE.

The Civil Dispensaries.

Proceedings of the Madras Government.

The following Order, dated 7th October, was passed by Government on a Report from the Principal Inspector General, Medical Department, dated 18th May 1864.

The Governor in Council has read, with much pleasure, the Report of the Principal Inspector General, Medical Department, on the Civil Dispensaries, for the year 1863.

2. The Returns show a slight increase in the number of persons treated during the year, the numbers being, for 1862, 272,502, and for 1863, 274,218 ; but their accuracy appears to be open to doubt from the probability that, in some cases, out-patients are entered daily as *new* patients. This, however, will be corrected by the system introduced by the Principal Inspector General, of returning, instead of "persons treated," "number of persons seen and prescribed for."

3. It is very satisfactory that the partial withdrawal of Government support to the Mofussil Dispensaries has had the effect of enlisting a large amount of public support for the institutions, which has obviated, in almost every case, the necessity for closing them.

4. The cost of the Provincial Dispensaries has been Rupees 86,561-10-10, an increase of Rupees 4,336-9-11 on the previous year, accounted for by increase of pay due to three Native Surgeons, the opening of a Dispensary at Conjeveram, and additional value of medicines supplied. The cost will be, it is stated, much reduced during the current year.

5. There has been a slight decrease in the cost of the Presidency Dispensaries and Hospitals, as shown below, while there has been an increase of nearly 4 per cent. in the number of persons treated.

6. The expenditure on each patient in the Mofussil has been—208,486 patients costing Rupees 86,561-10-10—Rupees 0-6-7 ; while at the Presidency it has been (excluding the Lunatic Asy-

lum)—65,663 patients costing Rupees 1,43,154—Rupees 2-2-10, or rather more than five times as much.

	Total expendi- ture.	Deduct Hospital stoppages.	Net cost to Govern- ment.
	RS. A. P.	RS. A. P.	RS. A. P.
1862...	1,68,918 4 1	3,855 10 9	1,65,062 9 4
1863...	1,68,113 4 4	4,497 10 10	1,63,61 5 6

7. The Governor in Council, while fully recognizing the fact that the peculiar circumstances of the Presidency town justify a very much larger expenditure on its charitable Institutions than on those of any other place in the Presidency, is constrained to observe that the expenditure of Rupees 1,43,154 on the town of Madras is excessive, while the sum of Rupees 86,561 suffices for the whole Mofussil. It is to be remembered, moreover, that the latter charge will be, for the present year, very much reduced, probably to Rupees 60,000. The General Hospital will be, ere long, complete, and it is highly desirable that such measures should be taken, before its completion, as will enable Government to throw the burden of supporting some of the Presidency Dispensaries upon the general public, with a fair prospect of success. The Government having recently resolved upon the erection of a Native General Hospital, which will, it is anticipated, supersede the Chintadrepettah and Vepery Dispensaries, it is the more incumbent on the public to come forward for the support of those which will, eventually, remain.

8. But this is beside the question of the average expense a head ; and though there is, no doubt, much greater cost necessarily incurred in a hospital for Europeans or East Indians, it does not seem to His Excellency in Council that that can be alleged as a sufficient reason for the great disparity in cost per patient shown above. The Principal Inspector General will take the question into early consideration, with the view of applying an effectual remedy.

9. The Governor in Council concurs in the observation of the Principal Inspector General that it is highly undesirable that the whole business of dieting the sick in Mofussil Dispensaries should be left to the Medical subordinates, which is unfair to them and to the sick : and he trusts that Local Managing Committees will endeavour to make arrangements for correcting the evil.

10. His Excellency in Council now proceeds to notice, in detail, those institutions which invite remark.

11. *Berhampore*.—This Dispensary must be closed forthwith,

unless a definite ground of expectation that it will ere long be self-supporting be held out.

12. *Combaconum and Manaargoody*.—The praiseworthy efforts which have resulted in making these institutions self-supporting have already been favourably noticed. No. 562 of 17th July 1864.

13. *Cuddalore*.—The remarks made by Government on the Dispensaries at this station, in reviewing the Report of 1862, seem to have had no effect. Nothing appears to have been done for the Civil Hospital, and only Rupees 19 per mensem has been collected for the Branch Dispensary. An immediate report will be called for, and if it appear that nothing has been done, one at least of the Dispensaries will be forthwith closed.

14. *Eye Infirmary*.—Dr. Shaw will be good enough to inform Government, with a view to obtaining sanction for their purchase, of the probable cost of the cataract glasses asked for by Dr. Smith.

15. *Leper Hospital*.—The attention of the Sanitary Commission will be called to this hospital, and their opinion asked as to the system to be adopted in improving the privies.

16. *Lunatic Asylum*.—The question of new Lunatic Asylums on the West Coast and elsewhere is under consideration, and the establishment of these institutions will reduce the number of applications for admission to the Madras Asylum.

17. *Lying-in-Hospital*.—The continued and increasing success of this Institution is most satisfactory, and reflects credit on those in whose hands it has been placed.

18. *Idiot Asylum*.—The same remark as that made in paragraph 15 applies to this Asylum.

19. *Foundling Hospital*.—The attention of the Sanitary Commission will be particularly called to the latter part of the extract from Dr. vanSomeren's Report. Government notice with much pleasure the efforts of this officer to better the sanitary state of his District.

20. *Madura*.—The operations in connection with this Institution, both as regards its funds and medical management, appear to be well judged.

21. *Malliapitram Dispensary* is, Government presume, already closed.

22. *Nellore*.—The munificent benefaction of the Zemindar of Vencatagiri of the whole cost of the Dispensary, has already been acknowledged by Government. The establishment of a branch Dispensary would seem a wisely considered measure.

23. *Pollachie*.—The attention of the Collector of Coimbatore will again be called to the reports on this hospital.

24. *Rajahmundry*.—The account of the funds of this Dispensary is not satisfactory.

25. *Raneept*.—This hospital was ordered to be removed to Wallajahpet in March 1863. No information is given as to why this was not done. It appears that no subscriptions can be obtained. The Governor in Council sees no alternative but to order its being closed from the earliest possible date.

26. *Secunderabad*.—The Government concur with the Principal Inspector General in the opinion that the community at this station are quite able to support their own Dispensary ; the allowance has been, it is presumed, withdrawn.

27. *Tinnevely Dispensary* has already been closed for in-patients and amalgamated with the Palamcottah hospital, and there appear to be no doubt that the combined Institutions will be fully supported.

28. *Tranquebar*.—Government are glad to find from a recent letter from the Collector of Tanjore, Dated 9th August 1864. that this Dispensary has been put upon an independent footing.

29. *Trichinopoly*.—It is gratifying to find that so much success has attended the efforts to give this Institution a permanent endowment.

30. *Vellore*.—The final remark in paragraph 24 applies to this Dispensary. It does not appear, however, that any efforts have been made to raise funds for the support of the Institution. The Governor in Council is willing to allow a further period for making the attempt, but after the 1st January next Government aid, except for medical aid and medicines, will be withdrawn.

31. *Vizagapatam*.—The Government notice with great satisfaction the efforts which have been made to improve the sanitary condition of this town, and the support which has been afforded to the Dispensary.

32. The Governor in Council has not thought it necessary to notice, in detail, the many complaints which the reports contain, arising out of the treatment of the Police at the Dispensaries. He is fully alive to the gravity of the objections raised. Final orders have been already issued on the subject, and it will be impressed upon the Inspector General of Police, and Principal Inspector General, Medical Department, that the Government consider the immediate relief of all Civil Dispensaries from the charge of attention to the Police, a point of the first importance. A copy of this paragraph will be communicated to the Public Works Department, with a view to the issue of instructions to Officers of Divisions, in which Police Dispensaries are sanctioned, to adopt measures to ensure their early completion.

33. The attention of the Principal Inspector General is called to the objectionable way in which the statements on page 8—11, and 18—21 are printed; there is nothing to guide the eye across the blank space caused by the fold of the page. The Dispensaries should be numbered and the same figures should be in a column at the left side of the right hand page.

Jail Dispensaries.

Proceedings of the Madras Government.

Read the following letter from the Inspector General of Jails.

(Here enter 9th April 1864, No. 682.)

Read also letter from the Secretary to the Government of India, Home Department, forwarding, with observations, copies of a report received from the Committee which assembled in Calcutta for the purpose of considering the subject of Jails and Jail discipline in India, dated 23rd June, and recorded in the Proceedings of the 26th September 1864, No. 1,384.

ORDER THEREON, 5th October 1864, No. 1,458.

In the Proceedings of Government, under date 22nd December last, the Inspector General of Jails was directed to report, in communication with certain officers, as to the best arrangement for the management of the District Jails, viz., whether they should be left as at present under the Zillah Judges, or whether they should be placed under the Zillah Surgeons, or under the District Magistrates or their Assistants, or whether any other arrangement would be preferable.

2. The opinions of the several officers who were consulted were submitted with Mr. Rohde's letter of the 9th April last. Previous to its receipt, a Committee had been appointed at Calcutta to inquire into, and report on, the present states of Jail discipline in India, and as it was understood that their report included a definite recommendation on the subject referred to in Mr. Rohde's letter, the Government deferred passing orders on the Inspector General's letter, until the report of the Committee in question could be considered in connection with it. That document has only lately been received.

3. The following are the opinions of the officers who have been consulted in this Presidency :—

The Inspector General of Jails, the Inspector General of Police, the Sessions Judge of Ootacamund, the Sessions Judge and Magistrate of Vizagapatam, and the Magistrate of Malabar, are all in favour of placing the charge of each District Jail in the hands of

the Magistrate of the District, with power to delegate the duty to one of his Assistants acting under his general supervision.

The Magistrate of Canara would maintain the present arrangement under which the Jails are superintended by the Zillah Judges.

The Sessions Judge of Coimbatore, and apparently the Inspector General of Jails, would place the Zillah Surgeon in charge of the Jail, if the Head Assistant Magistrate or an Assistant with full powers could not be located at the station. All these officers, with the exception of Mr. Morris and Mr. Carmichael, are opposed to the Sessions Judges being left in charge of the Jails. Mr. Carmichael has not expressed any opinion on this point.

All, except Mr. Harris and the Inspector General of Jails, are opposed to the Medical officers being placed in charge.

4. The principal objections advanced against this latter arrangement are, that the Medical officer has not usually had that training which is useful in directing the employment of convicts, and regulating the interior economy of Jails; that he has not the same means as a Magistrate of knowing how the convicts can be most usefully employed, nor of ascertaining the character and antecedents of each; that, as a general rule, the Medical officers in this Presidency are unacquainted with the Vernacular languages, whereas a knowledge of the Vernacular language of the District is an indispensable requisite to the efficient performance of the duties devolving on the officer in charge of the Jail, and, lastly, that the duties of the Medical officer are inconsistent with those of Superintendent of the Jail, inasmuch as the two officers ought to serve as a check on each other.

5. The Calcutta Committee, on the other hand, strongly recommended that the Superintendents of Jails, whether Central Jails or District Jails, should, as a rule, be selected from the Medical service. They advert to the fact that "almost all the zealous Jail reformers this country has produced have been Medical men." They recommend that "the management of Jails should be so far constituted a regular service that special aptitude should be held to possess a claim to promotion in the same line; that a specially qualified Medical officer should be always selected as Superintendent of a Central Jail; and that the Civil Surgeon, if a European and possessing suitable qualifications, should invariably have charge of the District Jail."

6. The Committee propose that the following salaries should be assigned to Superintendents of Jails:—

Superintendents of 2nd Class District Jails, containing not more than 300 prisoners, Rupees 80 per mensem, in addition to their pay and allowances.

Superintendents of 1st Class District Jails, containing not more

than 500, Rupees 150 per mensem also in addition to their *pau day* allowances.

Superintendents of Central Jails, containing not more than 1,000, a consolidated salary of Rupees 800 per mensem with free quarters, and if they have charge of the District Jail also, an additional allowance of Rupees 150 per mensem

7. In forwarding the Committee's report to the several local Governments, the Governor-General in Council has requested them to take early action in regard to the measures recommended by the Committee, as far as they may consider it expedient to adopt them.

8. The Governor in Council considers that the objections to the employment of Medical officers in the charge of Jails, are deserving of very serious consideration, especially that arising from their general ignorance of the vernacular of the prisoners; but, on the other hand, there are unquestionable advantages to be gained by their employment, such as their permanent location at the Jail station, and their lengthened tenure of office as compared with the Assistant or Head Assistant Magistrates, who could be placed in charge, and on these grounds, while not prepared to adopt the recommendation of the Bengal Commission, for the invariable employment of Medical officers as Jail Superintendents, the Governor in Council resolves to declare them eligible for such charge.

9. The Magistrate of the District will be accordingly entrusted with the general supervision of the Jail, and will nominate, from time to time, for the approval of Government, an officer for the immediate management of it, who will be either one of his Assistants, Covenanted or Uncovenanted, or the Zillah Surgeon of the station, such nomination being submitted to Government through the Inspector General of Jails, who will give his opinion in each case as to the fitness of the officer named. A knowledge of the vernacular language of the District will be deemed essential.

10. Allowances on the scale proposed by the Calcutta Committee will be assigned to the officer in immediate charge.

11. By this arrangement, the Magistrate and Collector, who is the officer best qualified to determine in what manner the prisoners should be worked, will be in a position to give a direction to their labour and to see that discipline is duly enforced; and in those cases in which the Medical Officer is placed in immediate charge of the discipline, as well as of the health of the prisoners, the Magistrate will act in some measure as a check upon him; on the other hand, the practical inconvenience which would often result from limiting the selection to the officers of the Magistracy will be avoided. The Governor in Council trusts that the arrangement now made will operate as an incentive to the Zillah Surgeons to acquire a knowledge of the vernacular languages of their respective

Districts, which cannot fail to be of use to them, whether they are only in charge of the health, or are likewise entrusted with the discipline of the jail.

The New Rules for the Army Medical Service.

The following is the despatch of Sir Charles Wood giving the rules and regulations to be henceforth followed in respect to the Army Medical Service. It was addressed to the Governor-General, and dated London 16th May :—

Para. 1. In connexion with the subject of the re-organization of the Medical Service in India, Her Majesty's Government have for some time past had under consideration the present state and future prospects of the Indian Medical Service in regard to promotion, and the system of payment to the Medical Officers of the Indian Army and those of the British Army serving in that country.

2. A final decision upon the arrangements connected with the future provision of Medical Officers for service in India has been delayed from unforeseen and unavoidable causes, but will be communicated to you very shortly.

3. In the meantime, Her Majesty's Government have determined upon the adoption of certain measures affecting the interests of the present service, in regard both to pay and promotion.

4. It has been found by experience that the promotion to the rank of Surgeon in the Indian Service has been much slower than the same in the British Service, and although this is in a great measure attributable to augmentations that have been made of late years in the latter, the difference, therefore, being in a measure temporary, it may in some degree be attributed to the difference which has hitherto existed in the relative numbers of the two grades in the two cases. In the British Medical Department I find the proportion which the Assistant Surgeons bear to the senior grades is as 641 to 355, while in the Indian Service it has been hitherto,—

In Bengal as 285 to 140

„ Madras 167 „ 76

„ Bombay 137 „ 56

5. To carry out the assimilation in this respect would require, therefore, the promotion of Assistant Surgeons in India to the following extent,—

In Bengal ... 12

„ Madras ... 10

„ Bombay ... 13

6. You are authorized to make these promotions from the date of the receipt of this despatch. The establishment of Medical officers above the rank of Assistant Surgeon in the three Presiden-

cies will, so long as there are officers enough remaining on the old lists to complete these numbers, be fixed,—

In Bengal	... 152
„ Madras	... 86
„ Bombay	... 69

7. With a view of removing all cause of complaint and misunderstanding, on the part of the officers of the Indian Medical Service, on the subject of their promotion to the rank of Surgeon Major, under the Royal Warrant of 13th January 1860, Her Majesty's Government have determined to give retrospective effect to that Warrant, and to cause all promotions made under its authority to be dated from the 1st October 1858, being the date of the Royal Warrant for the British Medical Department, and it has been further determined to modify the instructions conveyed to you in my Despatches, No. 397, dated 31st October 1860, and No. 386, dated 30th September 1861, and to permit the period of service qualifying Surgeons for the rank of Surgeon Major under that Warrant to be calculated from date of first commission, including all leave of absence of whatever kind.

8. It has been further resolved that the following change in the mode of payment of officers serving in India, whether of the British or Indian Medical Department, shall be introduced from the date of the receipt of this Despatch.

9. From that date, the allowance of head money, as well as that for medical charge of British regiments and brigades, will be discontinued, excepting in the case of Assistant Surgeons, who will receive, while in actual charge of British regiments or brigades of Artillery, a special allowance of Rs. 150 per mensem in addition to their pay.

10. The following will be the rate of pay for officers of the several grades in the Medical Department, below that of Inspector and Deputy Inspector General, who receive special salaries, whether belonging to the British or the local service:—

Rank.	Years' Service.	Relative Rank.	Half Batta.			Full Batta.		
			Rs.	A.	P.	Rs.	A.	P.
Surgn. Major	25	Lt. Col.	888	12	0	1,093	2	0
„	20	„	852	3	7	1,056	9	7
Surgeon.	15	Major.	777	6	11	825	11	5
„	10	„	640	14	6	789	3	0
Asst. Surgn.	10	Capt.	410	9	5	451	14	5
„	6	„	392	5	2	433	10	2
„	5	Lieut.	304	14	2	335	12	2
„	under 5	„	286	10	0	317	8	0

11. Surgeons of Her Majesty's Service, not being Surgeon-Majors, who may be in medical charge of regiments or brigades at the date of publication of the order, will not be affected by this rule, but will continue to receive their pay and allowances while attached to such regiments as heretofore.

12. Officers of the British Medical Department attached to brigades of Horse Artillery and regiments of British Cavalry will draw, in addition to the rate of pay above laid down, horse allowance at the following rate :—

Rank.	Years' Service.	Relative Rank.	Additional horse allowance when attached to a British Cavalry Regiment.
Sur-Major.	25	Lient. Colonel.....	Rs. 90 per men-sem.
"	20	"	
Surgeon	15	Major.	
"	10	"	
Asst. Sur.	10	Captain.....	Rs. 60 per men-sem.
"	6	"	
"	5	Lieutenant.....	
"	under 5	"	

13. Officers of the Indian Medical Service will receive pay while on furlough in Europe according to the following scale :—

Rank.	After 30 Years' Service on Full Pay.		After 25 Years' Service on Full Pay.		After 20 Years' Service on Full Pay.		After 15 Years' Service on Full Pay.		After 12 Years' Service on Full Pay.		After 10 Years' Service on Full Pay.		After 5 Years' Service on Full pay.		Under 5 Years' Service on Full pay.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
Insp. Genl.	2	5 0	2	5 0	*2	0 0	—	—	—	—	—	—	—	—	—	—
Depty. Insp. Genl.	1	14 0	1	10 0	*1	8 0	—	—	—	—	—	—	—	—	—	—
Surg. Major.	—	—	1	5 0	1	2 0	—	—	—	—	—	—	—	—	—	—
Surg.	—	—	—	—	—	—	18	0	15	0	—	—	—	—	—	—
Asst. Surgeon.	—	—	—	—	—	—	—	—	—	—	13	11	6	10	0	0

* Or on promotion, should these periods of service not be already completed.

14. The rule regarding pension, at present applicable to the officers of the Indian Medical Service, will remain in force with the following modification.

15. Officers compelled to leave the service on account of ill health, and entitled to half pay pension under present regulations, will be allowed the half pay of their relative rank, as laid down in the Royal Warrant, dated the 1st October 1858. This rule will apply to all Officers retiring upon half pay pension from a date subsequent to the receipt of this Despatch.

16. Pending further communication upon the subject of the Medical Service in India, Officers of the British or Indian Medical Service holding Staff appointments, the salaries of which are consolidated, will continue to draw their salaries as at present ; and all officers of the Indian Medical Department in the receipt of Staff salaries, including such as are in medical charge of Native regiments, will continue to draw the aggregate amount of pay and staff allowances they now receive, provided it be not less than the rate of pay laid down in the above Table for Officers of their rank and standing in the service.

17. In communicating to the Secretary of State for War the proposal to adopt the above modification, in the mode of payment of British Medical Officers in India, I expressed an opinion that, considering the extent to which the strength of regiments of British Infantry had been lately reduced, the number of Assistant Surgeons with their corps might, with propriety, be reduced from three to two, the reserve of Medical Officers of the British Army, which it is proposed to maintain to meet the demands of the British Army in India generally, being so calculated as to ensure at least that number of Officers being at all times available with each regiment.

18. The Secretary of State for War has consented to this reduction, upon the understanding that it shall be considered an experimental arrangement, and that the Staff Assistant Surgeons constituting the reserve shall be considered as forming part of the Medical staff at the disposal of the Military authorities.

19. The establishment of Staff Surgeons and Assistant Surgeons of Her Majesty's service at present allowed is as follows :—

1 Inspector General of Hospitals.

4 Deputy ,, ,,

10 Staff Surgeons.

30 Staff Assistant Surgeons.

20. You will consider and report at an early date whether this number of Assistant Surgeons will suffice, under the present arrangement, to ensure the constant supply of two Assistant Sur-

geons to the whole of Her Majesty's regiments, or what increase may be required for that purpose.

I have the honor to be,

Sir,

Your most obedient humble servant,

(Signed) CHARLES WOOD.

The Medical Warrant for the Indian Armies.

The following is the text of the New Medical Warrant, signed by Sir Charles Wood, dated India Office, 7th November 1864 :—

Para. 2. In a Despatch, No 82, dated 12th March 1862, the late Governor-General in Council recommended the formation of an Amalgamated Medical Service for the united Army of Great Britain and India, and expressed his concurrence generally in a scheme for carrying out such a measure, embodied in memorandums by Colonel Norman which accompanied that Despatch.

3. A very important feature in the working of that scheme was the unavoidable removal of Medical Officers from employment in India after a limited number of years' service in that country, whatever their employment might be.

4. I was apprehensive that this might be attended with serious inconvenience, but, after much and careful consideration of the subject, I resolved to submit the proposal, with some slight modifications, for the concurrence of the Secretary of State for War.

5. I forward the correspondence which has taken place upon the subject, by which it will be perceived that Earl de Grey objects to the scheme mainly on the following grounds :—

1st. That the employment of British Medical Officers for limited periods in Civil situations in India would put a stop to the continuous military training secured under the present system of the Army Medical Department, and considered by him to be essential to the efficiency of the service ; that Officers so employed might acquire habits of independence inconsistent with a due performance of regimental duties, and would have to return to a regiment at an age when men in general do not easily bend themselves to the practice of subordination required from a regimental Officer of inferior rank.

2nd. His time, it is stated, would have been spent in treating diseases different to a great extent from those of soldiers, and he would have acquired no experience, and have had no occasion to practice that most important part of his duty as an Army Medical Officer, the prevention of disease. He would, in short, not be the

Officer whom the existing organization of the Medical Department of the British Army contemplated, and whom it is the object of the costly and elaborate system recently established to provide for the Army.

3rd. Earl de Grey further objects, that "regimental duties with Native troops are at present of a very different nature from those required in British regiments, and would not afford Medical Officers the training and experience which the new organization has rendered essential," and lastly, His Lordship observes, that if the amalgamation were once carried out on these principles, it would be extremely difficult, if not impossible, to abandon them hereafter, whatever might be the result.

6. In my reply, I explained to Earl de Grey and Ripon my reasons for not being able to concur in the objections offered by His Lordship, but as I felt satisfied that those objections had not been lightly entertained, I felt that it would be useless to press a reconsideration of the subject.

7. It was further obvious from the correspondence, that any plan involving the withdrawal for time from their regular duty of the Officers of the Army Medical Department, would be liable to objection on similar grounds, and Her Majesty's Government directed their attention therefore to the possibility of providing for the future demands of the Government of India by the formation of Medical Staff Corps for each Presidency.

8. In order to obtain for the Medical Service in India the advantage of having its Officers drawn from the same source, and having passed the same examination as those of the British Army, and with a view of placing them on a footing of perfect equality by obliterating as much as possible all distinction between the bodies of Officers so employed, and those of the British Army, it was proposed to form the several Staff Corps by means of Medical Officers of Her Majesty's service volunteering to join them.

9. With this view, however, it became necessary to obtain the sanction of Parliament to the repeal of that part of the Act of the 16 and 17 Vict. Cap. 95, Sect. 37, which prescribes the manner in which Medical Officers shall be provided for employment under the Government of India.

10. Her Majesty's Government having failed to obtain the consent of Parliament to a measure proposed with this view, it became necessary to give up the scheme of a Medical Staff Corps, as proposed, and to revert again to the system of an entirely separate service, as heretofore.

11. The changes which have been recently made in the amount and composition of the Military force in India, the transfer of the whole of the European troops to the British Army, and the reduc-

tion of the Native force, render necessary a corresponding reduction in the establishment of Medical Officers serving under the local Government, as well as some change in the nature of their employment.

12. One of the objects aimed at in the contemplated union of the British and Indian Medical Service was the abolition of the double administrative Staff in India. This advantage would have been unattainable on the formation of Medical Staff Corps, and is equally so in the continuance of a separate service as now proposed.

13. It is obvious that a single Medical Staff for all India is only compatible with one amalgamated Medical Service, and that the objections advanced by the Secretary of State for War, and which have proved fatal to the scheme of amalgamation, must apply with even greater force to any plan that would involve the indiscriminate employment of Officers from either service in the supervision of both.

14. The evils that have resulted up to the present time from the employment of a double Staff will, it is believed, disappear when the duties of the Officers of the two services shall have been entirely separated. The sole objection to such double Staff will then consist in its expense. This, I apprehend, will, on a re-adjustment of the local department of Inspection, with a view of meeting the altered condition of the service, be found susceptible of considerable reduction.

15. Her Majesty's Government have therefore determined that the duties of the Medical Officers of the British Army serving in India shall, in future, be kept wholly distinct from those of the Medical Officers of the Indian establishment, and that there shall be a separate administrative establishment for each.

16. Under these circumstances, it will be necessary that the administrative establishments in the several Presidencies should be revised, and the duties of the several Medical Officers of the higher grades re-distributed, and I request that you will take the subject into early consideration, with a view of determining the numbers of Inspectors-General and Deputy Inspectors-General of each service that will be required to conduct the administrative duties of the respective services in each Presidency.

17. In my Despatch, No. 152, I authorized your augmenting the number of Officers above the rank of Assistant Surgeon.

In Bengal to	...	152
„ Madras „	...	86
„ Bombay „	...	69

leaving the aggregate establishment of Medical Officers in each Presidency the same as before.

18. That establishment is at present as follows :—

In Bengal to	...	425
„ Madras „	...	243
„ Bombay „	...	193

19. You were informed, in my Despatch, No. 291, dated 8th August 1863, that the War Office would take measures for relieving, as soon as possible, the Assistant Surgeons of the Indian Army from the brigades of Artillery and new Line regiments, and the same course will hereafter be adopted as a necessary consequence of the transfer of those regiments to the British Army, in regard to the Surgeons. A reduction in the establishment of Medical Officers required for service in India will necessarily follow, and I request that the subject of the number likely to be required henceforward in the several Presidencies may receive your early consideration.

20. In making this calculation you will, of course, take into account the several situations which may be properly filled up by uncovenanted members of the Medical Profession.

21. It is believed that, in consequence of all appointments to the local service having ceased during the last three years, the aggregate number of Medical Officers at present borne on the strength of the several Presidencies will be, if anything, below the prospective wants of the service, but I shall make arrangements without delay for filling up vacancies as they may occur on your revised establishment.

22. The promotion of Assistant Surgeons who may hereafter enter the Indian Army will be regulated by length of service, and not, as heretofore, by succession to vacancies in a fixed establishment of Officers of the higher grades.

23. Assistant Surgeons of 12 years' service from the date of first commission, (of which two years shall have been passed in charge of a Native regiment), who shall have passed the prescribed examination in professional subjects, will be promoted to the rank of Surgeon.

24. The benefit of this rule is to be extended to all Assistant Surgeons now in the Indian Service, but officers now in the service who may be so promoted will be considered supernumeraries to the establishment of Surgeons as recently laid down, so that no promotion by seniority will take place until such supernumeraries are absorbed.

25. You will make the promotions consequent upon this concession from the date of receipt of this Despatch.

26. In the Despatch above referred to, I informed you that you were authorised to introduce certain changes in the mode of payment of Officers of the Medical Department serving in India, and you were informed that, pending a further communication upon the subject, officers of the British or Indian Medical Service, holding

Staff appointments, the salaries of which are consolidated, will continue to draw their salaries as at present ; and all Officers of the Indian Medical Department in the receipt of Staff salaries, including such as are in medical charge of Native regiments, will continue to draw the aggregate amount of pay and Staff allowances they now receive, provided it be not less than the rate of pay laid down in the above table for Officers of their rank and standing in the service.

27. I have now to inform you that it has been determined that in future all employment on the part of Medical Officers of the Indian Service involving the receipt of special Staff salary shall be considered as Staff employment, the salaries being in all cases consolidated ; and that all appointments, whether Civil or Military, held in future by Officers of the present Indian Medical Service below the rank of Deputy Inspector-General, will be alike tenable by Surgeon Majors, Surgeons, and Assistant Surgeons.

28. The salaries of the principal administrative and military appointments are fixed at the following consolidated sums :—

Inspector General.....Rs.	2,500	} Whether of the British or Indian Medical Service.
Deputy Inspector General..	1,800	
Surgeon Major in charge of Native Regiments.....	1,000	} With Rs. 90 horse allowance in Cavalry Regiments.
Surgeon in charge of ditto....	800...	
Assistant Surgeon above 5 years' full pay service in charge of Native Regiments.	600...	With Rs. 60 ditto.
Assistant Surgeon under 5 years' ditto.....	450...	With Rs. 60 ditto.

But Officers now in the Indian service will receive the pay due to their rank as laid down in para. 10 of my Despatch, No. 152, of 16th May 1864, when such pay is in excess of the consolidated salaries above-mentioned.

29. Officers who may hereafter be appointed to the Indian Medical Service will receive pay when unemployed in India according to the following scale :—

Rank.			Years' Service.	Unemployed Pay.		
				Rs.	A.	P.
Surgeon-Major....	...	...	25	888	12	0
Ditto	...	...	20	852	3	7
Surgeon...	...	...	15	677	6	11
Ditto	...	...	12	640	14	6
Assistant Surgeon	...	...	10	410	9	5
Ditto	...	...	6	392	5	2
Ditto	...	...	5	304	14	2
Ditto	...	...	under 5	286	10	0

30. The salaries of other Medical appointments in the Civil and Military Departments will be revised with reference to the above, and fixed at a consolidated sum, and I request that a report may be made to me upon the subject with as little delay as possible. In the meantime, the aggregate sums at present received in each case will continue to be drawn.

31. With a view of promoting the efficiency of the service, it has been further determined that the tenure of office by a Deputy Inspector-General of the Indian Service shall, as in the case of Inspectors-General, be limited to five years; Officers being, however, if not disqualified by age, eligible either for employment for a second tour of duty in the same grade, or for employment in the higher grade of Inspector-General by promotion thereto.

32. You will follow, in the cases of Officers now holding the office of Deputy Inspector-General, the same course which your Government adopted in 1861, in regard to Combatant Officers holding certain Staff appointments, and permit all such to hold their offices for two years longer, irrespective of the periods they may severally have served in them. Should any Officer have served up to the present time less than five years he will be allowed to complete a full period of seven years.

33. The rank of Inspector-General and Deputy Inspector-General conferred upon Officers of the Indian Medical Service under the Royal Warrant of the 13th January 1860, is to be considered as substantive rank.

These Officers, on vacating office at the expiration of the five years' tour of duty, will be permitted in future to draw respectively an unemployed salary of Rs. 1,200 per mensem in the former, and Rs. 900 in the latter case for a period of six months from the date of their vacating office, after which they will be placed while unemployed on the rate of pay laid down in my Despatch of the 16th May 1864, for Officers of corresponding rank in Europe. These sums, deducted from the consolidated salary, will regulate the moiety of Staff salary to be drawn by Officers of those grades during absence on sick certificate. The decision reported in the 3rd paragraph of your letter No. 242 of 1864 will cease to operate from the date of publication of the present Despatch.

34. With a view to improving the position and prospects of Officers of the Indian Medical Service, it has been resolved to introduce prospectively the following revised pension rules.

35. Officers of the Indian Medical Service will be allowed to

retire on the following scale of pension, on completion of the required periods of service :—

	£	Leave
After 30 years' service in India, 550	550	30. 4 years
" 27 " " " 456	456	25-30. 3 "
" 24 " " " 365	365	20-25. 2 "
" 21 " " " 292	292	17-20. 1. 8 "
" 17 " " " 220	220	

36. An Inspector-General, after five years' active employment in India in that grade, will be entitled to retire upon a pension of 350*l.* per annum, in addition to that to which he may be entitled under the above scale.

37. A Deputy-Inspector General will, after five years' active employment in India in that grade, be entitled to retire upon a pension of 250*l.* per annum, in addition to the pension to which he may be entitled under the above scale.

38. In each of the above cases, six months' absence on Medical Certificate will be allowed to count towards actual service in those grades.

39. Officers now in the Indian Medical Service will, on retirement, have the option of pension according to the above rules, or according to those now in force.

40. My attention has been directed on this occasion to the rule regarding the qualification of an Assistant Surgeon for promotion to the rank of Surgeon required under Clause III. of the Royal Warrant, dated 13th January 1860. There can be no doubt that this rule, which has been again brought to notice by a recent Despatch from your Government, requiring a service of two years in or with a regiment, bears very hardly on many Officers, the nature of whose employment precludes their showing the required qualification, and who, on entering the service, had no reason to suppose that such a regulation would be adopted.

41. These considerations have induced me to consent to exempt from the operation of the clause of the Royal Warrant all the Assistant Surgeons who entered the service prior to its date. It is to be understood, however, that the rule is to be strictly enforced in the case of all Medical Officers who entered the service after January 1860.

42. In my Despatch, No. 152, of 16th May 1864, para. 7, I informed you that Her Majesty's Government had determined to modify the instructions given in my Despatches of the 31st October 1860 and 30th September 1861, and to permit the period of service qualifying Surgeons for the rank of Surgeon-Major, under that Warrant, to be calculated from date of first commission, including all leave of absence of whatever kind.

43. I have now to inform you that the same principle is to be observed with respect to the grant of honorary rank on retirement, under the Clause 14 of the Royal Warrant, and that the 25 years' service qualifying for a step of honorary rank, the requirements of the clause in other respects being fulfilled, shall be inclusive of all leave of absence.

44. I have further to inform you, that it has been determined, as in the case of combatant Officers of the Indian Army, to confer upon the Medical Officers of that service Royal Commissions in substitution for those which they now hold, conferring rank in Her Majesty's Service in any part of the world. The Medical Officers of Her Majesty's Indian Service will not, however, be required to serve out of India, except with their own consent.

45. I have, lastly, to inform your Excellency that Assistant Surgeons appointed to Her Majesty's Indian Service in future will not be called upon to become Subscribers to any Military or Medical Funds, and that Her Majesty's Government have determined to guarantee to present incumbents on, and Subscribers to, the several Medical Funds the Annuities and Pensions to which they are, or to which they, their widows and children may become entitled from those Funds, according to the regulations now in force, and at the present rates of subscription. But this guarantee must be regarded as conditional on the absolute transfer of the assets of the Fund to the Government, and must not be construed as conveying to any Fund, or to any Member of it, benefits which are not actually provided for in the regulations as at present in force.

46. The widows and children of Medical Officers hereafter appointed to Her Majesty's Indian Service will be granted pensions not less than those to which they would be entitled under the provisions of the Royal Warrant of June 15th, 1855.

47. The above measures which obviously tend greatly to improve the condition and prospects of the Medical Service in India, cannot be carried out, as your Government will at once perceive, without a heavy expense to the State. It is hoped, however, that the result will be at once to diffuse a spirit of satisfaction and contentment among the Officers now in the service, and to secure for the future a certain supply of Medical Officers of good social position, liberal education, and professional ability for Her Majesty's Service in India.

I have the honor to be, Sir,

Your most obedient humble Servant,

(Signed) CHARLES WOOD.

Temporary Rules regarding pay of Medical Officers.

No. 470 of 1864.—The following Extract from General Orders by the Government of India, is re-published :—

Fort William the 26th November 1864.

No. 953 of 1864.—There being considerable misunderstanding with respect to the pay and allowances to be drawn by Medical Officers under the instructions contained in the despatch of the Secretary of State published in Government General Order No. 507,* of the 20th June 1864, the following rules are laid down for observance in the three Presidencies, with effect from the date laid down in Government General Order No. 598, of the same day, and pending further reference to the Secretary of State.

1. All Medical Officers, whether of the British or Indian Forces, who were in receipt of consolidated salaries at the date of publication of the General Order, or who may have subsequently succeeded or may hereafter succeed to situations, the salaries of which are consolidated, will draw such consolidated salary and no more.

When so situated as to be entitled to draw only half Staff Salary, such officers will draw the pay of their rank according to para. 10 of the despatch of the Secretary of State, and half the difference between the sum and the amount of the consolidated salary.

In such case the Officer acting will also draw the new rate of pay for his rank and the half difference remaining undrawn by the permanent incumbent.

2. Surgeon-Majors serving with British Regiments will draw pay according to length of Service as laid down in para. 10, with the addition of the Horse allowance sanctioned in para. 11 if attached to Regiments of Cavalry or to Brigades of Horse Artillery, and of Rupees 30 if attached to Brigades of Field Artillery.

3. Surgeons of British Regiments who were in Medical charge of Regiments of British Cavalry and Infantry on the 20th June 1864, will be allowed to continue to receive the pay and allowances then drawn.

Their claim to the old rate will not be invalidated by their proceeding on leave in India and ceasing for a time to draw Staff Salary or Head money. During such period they will draw the new rates of pay of their rank and on return to their corps, receive their old emoluments.

When promoted to Surgeon-Major, they will draw only the pay of that grade.

4. Surgeons of British Regiments who were not in charge of Corps on the 20th June 1861, are only entitled to the new rates of

* Madras G. O. G. 12th July 1861, No. 261.

pay of their grade whether absent or present, with the prescribed Horse allowance if attached to Cavalry or Horse Artillery, and Rs. 30 Horse allowance if attached to Field Artillery.

5. Assistant Surgeons of the British Service will in all cases receive the pay of their Standing as laid down in para. 10, with an addition of Rupees 150 if in Medical charge of a Regiment of Cavalry or Infantry, or Brigade of Artillery, or a permanent Depot, besides Rupees 60 per mensem Horse allowance if with Cavalry or Horse Artillery, and Rupees 30 if attached to Field Artillery.

6. Medical Officers of the Indian Service who do not come under the provisions of Clause I. of this order, will draw the same pay and allowances as before the issue of the Order, unless it is below the pay assigned to their rank in para. 10 in which case they will be permitted to draw the higher rate of pay. In the latter case they will draw Horse allowance at the prescribed rates if with Cavalry, Horse Artillery or Field Artillery.

7. Medical Officers drawing pay under the old rules will receive any advantages to which they would become entitled by these rules in consequence of promotion or having completed five, six or ten years' Service as Assistant Surgeons.

8. Medical Officers, whether of the British or Indian Service holding Staff appointments, and in receipt of Staff or half Staff salaries, will, until further orders, draw the present rates of Staff salary in addition to the old scale of pay, receiving any increase in the latter to which they would have become entitled by promotion, unless the aggregate shall be less than the pay of their grade under para. 10 of the Secretary of States' despatch, in which case they will receive the latter only. When on leave they will draw the new rates of pay without Staff salary, the acting incumbent drawing the Staff salary with the old rate of pay, or the new rates without Staff pay, as may be most advantageous.

9. Conveyance allowance will not be admissible to Assistant Surgeons on the new rates of pay.

10. The authorized allowance for the Medical charge of the Staff of Divisions or Brigades, will be passed in addition to pay and allowances whether on the old or new scale.

The foregoing is in substitution of any orders or decisions on the subject that may have previously been given.

(Signed) H. MARSHALL, *Colonel,*
Secretary to Government.

Rules regarding Attendance upon Police Cases and Post Mortem Examinations.

The following Rule sanctioned by Government, is reprinted for the information of all Medical Officers :—

“ All Medical Officers shall be held liable to attend, when required by Officers in charge of the Police and other competent authority, to examine corpses and wounds likely to become the subject of judicial inquiry, for which duty Medical Officers not holding the office of the Civil Surgeon of the District shall receive a fee of Rupees 15, and travelling allowance of 8 Annas a mile, if the distance exceed five miles. Corpses and wounded persons shall, as a rule, be taken to the Medical Officer's station in all possible cases, in order that he may not be withdrawn from his regular duties except on a very pressing emergency.”

Under instructions from Government the attention of all Medical Officers in Civil employ is drawn to the provisions of the Civil Service Absentee Rules, which restrict the period for which leave on Medical Certificate can be granted in this country to 15 months.

Dispensary at Goodaloor.

(Proceedings of the Madras Government.)

Read the following letter from R. Cole, Esq., Principal Inspector General, Medical Department, Fort Saint George; to the Honorable A. J. Arbuthnot, Chief Secretary to Government, Fort Saint George; dated 3rd November 1864, No. 379.

I have the honor to forward, for the consideration of Government, a report by Assistant Surgeon R. E. Pearse, Civil Surgeon of Malabar, on the apparent causes of recent sickness at Goodaloor, in Wynaad.

2. The past season has been very unhealthy, not only at Goodaloor but throughout the Wynaad and slopes of the Neilgherry Hills. What the immediate causes of the unusual development of the malarious poison may have been, it is impossible to say. Experience shows that such seasons do now and again occur, irrespective of the presence of dirt, or the best sanitary precautions. The locality of Goodaloor is, doubtless, an objectionable site for a settlement and the report testifies to the absence of all regulations for preserving the place in a good sanitary condition.

3. The recommendation for the establishment of a Dispensary, Government may, perhaps, deem fit to communicate to the Planters' Association in Wynaad. In the event of the residents subscribing for this object, I am of opinion that Government might give a

Medical Subordinate and medicines, as is now done elsewhere, when the people unite to bring medical aid within their reach.

4. Dr. Pearse having been obliged to travel *via* Ootacamund, on account of the monsoon season preventing his reaching Goodaloor by the direct route, I have to recommend that the usual travelling allowance be passed to him while engaged upon this tour.

Report on the recent severe epidemic of Fever at Goodaloor.

Agreeably to a telegram received from the Deputy Inspector General of Hospitals, Mysore Division, conveying orders from the Principal Inspector General for the nearest Medical Officer to proceed to Goodaloor, to afford medical aid to the inhabitants, received on the 27th August 1864, and assigning that duty to me, I proceeded to take the necessary steps for securing the due performance of my duties in my absence, and started for that place on the morning of the 29th, but finding that, owing to the recent heavy rains, it was impossible to travel through the district, I was compelled to take the more circuitous route, *via* Coimbatore, Ootacamund, from which latter place Goodaloor is distant only about twenty-two miles.

2. On arriving at Goodaloor, I proceeded with as little delay as possible to the Sub Magistrate's Office, he having (as I was previously aware) been most energetic in his efforts to do good throughout the period of the epidemic, and there found that the fever had almost entirely disappeared, at least in an acute form, there being only some 30 or 40 sick people in the place, who were suffering from one of the following diseases, *viz.*, general anasarca, asthæmia, chronic dysentery or diarrhoea, all the results of previous attacks of fever, from the acute stage of which they have recovered. The condition of these poor people was generally very sad, their gaunt faces, and emaciated bodies but too plainly showing that starvation was not only a major cause of these secondary atonic forms of disease, but was also doubtless one of the principal productive causes of the epidemic itself. Many of them too were the children (orphans) or sole remaining members of families, all of whose relatives had perished in the place, and who were therefore not only destitute, and from illness unfit to work and support themselves, but were likewise deprived of those to whom they would under other circumstances have looked for food and shelter in their hour of need. Indeed, were it not for the charity of the Sub-Magistrate (aided by one or two of the District authorities), who has for some time past daily issued food to these poor creatures (though of course only to a limited extent), but few of them would, I fancy, have been alive to tell the tale of their sufferings. Fever as an epidemic had, however, quite disappeared.

3. The history of the epidemic, so far as I have been able to arrive at the facts, for the contradictions in the various statements

picked up from different local sources were numerous, appear to be somewhat as follows :—For years past as is well known Goodaloor has been one of the most deadly fever spots in Wynaad, the annual recurrence of the disease generally showing itself from March at the earliest, to May at the latest. This year it set in at an early period, towards the latter end of March, after an unusually prolonged dry season, but was not at first of a very virulent type, nor were the cases unusually numerous ; however, about the same time a murrain set in amongst the cattle, commencing on the Goodaloor side of the Karkar Ghaut, and gradually spreading so as to reach Goodaloor in April, when the disease at once assumed a much more serious type, and extended from the town itself to which it was at first almost entirely, if not quite, confined to the adjacent districts. This murrain in the cattle proved injurious in two ways, 1stly, the deaths were so numerous that many animals were left unburied, thus loading the air with foetid emanations, rendering the disease both more violent in its actual attacks and also greatly extending its ravages, if not actually generating the disease ; and 2ndly, the Koters (Hill tribe, principally smiths), and many of the Pariahs, who at all times are fond of eating meat in a state of incipient decomposition, partook largely of the carcasses of these diseased animals, and as might be expected, suffered largely in consequence. In the two following months, May and June, another source of mortality arose in the importation into the place of cholera by coolies coming from Mysore, and many people being weakened by fever, or predisposed to bowel complaints by the unwholesome food above referred to, a small number perished from this disease also, but it never spread to any great extent, and of those attacked not a few recovered, under the use of medicines which I had previously supplied to the Sub-Magistrate, at the Collector's request, for distribution upon the first appearance of the disease.

I may here add also that large supplies of quinine and other fever medicines, accompanied by written instructions as to their use and mode of administration, were supplied at the requisition of the Collector and also of the Superintendent of Police, but, so far as I can learn from description, the disease, both in its type and extent was too formidable to be much influenced by such mild measures as these, more especially when the distribution of them lay in the hands of one who, though I believe a most zealous officer, was still a non-professional man, and moreover had other duties to perform. I should mention that, when the illness was at its height, the Collector endeavoured to obtain a Medical Subordinate to send up to the place, but unfortunately without success.

Another case which rendered the mortality very great was that so many of the coolies were struck down by the fever while travelling to Goodaloor, and laid down and died on the roads, far removed from all possibility of aid.

The mortality in the town itself, as estimated by the Sub-Magistrate, would amount to 40 per cent. of the entire population, the numbers in previous to the setting of the epidemic being computed at 1000, of which, should all return who escaped unscathed from the place (as they are now rapidly doing), not more than 600 will remain.

4. Of the symptoms and causes of the disease itself, it is almost impossible to form an accurate idea, from the vague descriptions of general observers ; but so far as I can judge from hearsay, the special characteristic of the attack seems to have been the excessive duration and unusual severity of the first or cold stage of the disease, which so utterly prostrated the strength of those attacked, that if (as in the case of coolies travelling in) assistance was not at hand, they perished in a very few hours, being utterly incapable of doing aught for themselves ; and even with those attacked in their own houses, and with friends both able and willing to assist them, yet these ague fits were so severe that if not speedily arrested by the use of medicines, one or two returns of the fever reduced the patient so low as to render recovery well nigh hopeless. Cerebral complications of an acute type, on the other hand, appear to have been almost unknown. The sequelæ amongst those who rallied have already been enumerated, but one fact in connection with them is curious, viz., that amongst the coolies who have recovered and found their way down here (to Calicut) for treatment, I have found enlargement of the spleen, a common, in fact a general, sequel ; whilst at Goodaloor itself it scarcely existed at all. The only explanation which occurs to me of this strange fact, and that a somewhat unsatisfactory one, is that the cases seen on the spot were of more recent date than those seen down here, and that this consequence of the fever may not, therefore, have had sufficient time to develope itself.

5. Having thus briefly traced the history and character of the epidemic, together with a few of the more important causes affecting its rise and progress, I would beg to be allowed to make a few remarks on the general condition and requirements of the place, as derived both from my own observations while there, and the opinions and wishes expressed by the residents, points which, if attended to now, may prevent the recurrence of similar disasters in future.

6. The town of Goodaloor itself cannot be said to be any thing but badly situated ; for though that portion of it, situated furthest from the Ghat, running north-west, is capable of great improvement, the portion contiguous to the Ghat, running south-west (on approaching from the Ooty side), will be difficult to render healthy. At present, the whole place is choked by excessive vegetation, though I am assured that even in this respect great improvement has taken place of late, for though the frontage into the central street is well enough, still on going to any of the houses you find the growth almost chok-

ing up the back exit, so that there cannot possibly be any current of air through the houses (and side windows, or doors, there are of course none), so that the enclosed air is simply reduced to a state of stagnation. This is a very serious evil, and one which is capable of easy remedy, for I cannot conceive there can be any hardship in requiring each inhabitant to keep a space of 10 or 12 yards, immediately in rear of his own dwelling clear from vegetation, whereas in this case such vegetation is only underwood, and capable of removal at a very small expenditure of labor.

7. Another active cause of disease is the reckless manner in which offal and putrid animal remains are left lying about the place, for the inhabitants, especially the Koters and Pariahs, are extremely fond of animal food, and the consumption of it is consequently large, whilst the manner in which the slaughtering of the cattle is carried on is most careless, for the place is so overgrown with underwood, that when wishing to slaughter an animal, they simply take possession of the first yard or two of open ground they find contiguous to the bazaar, probably (as I myself saw) within a dozen yards of the houses, and there kill it, leaving the offal about to putrify, or be eaten in a semi-putrid state by the Koters if they find it, as the chance may be. To remedy this, I would suggest the establishment of a village slaughter house (a suggestion which I should add the residents strongly favor), at the same time constituting the slaughtering of cattle elsewhere, within a fixed reasonable distance of the town, an offence punishable as a nuisance or otherwise, as may seem most advisable. With the terrible example of the effects which putrid animal matter produced on the fever during the recent epidemic, such a measure cannot, I am sure, be regarded as other than salutary and just.

8. The next measure to which I shall refer is one in which the entire neighbourhood is greatly interested, and by which it would be materially affected. I mean the establishment of a Dispensary under the care of an experienced Apothecary or Dresser. As this may at first sight appear a somewhat extensive and unnecessary demand, as I confess it did to me on being first suggested to me there, I will now proceed to show the grounds on which I was led to perceive that it is only a fair and reasonable demand on the part of the neighbourhood. As stated in a previous portion of this report, the population of the town of Goodaloor itself was at the commencement of this year, about 1000, and is now probably reduced to some 600; but this I found represent but a very small portion of those who are interested in, and would be benefited by such an institution; as on the Goodaloor slope of the Ghat alone, within a radius of 10 or 12 miles, there are some 20 odd distinct coffee estates, superintended by some 70 European and East Indian Overseers (the majority of Europeans), and employing probably about 5000 coolies per

annum, to which must also be added two large Government establishments, viz., those of the Engineer Department (Department Public Works) and the Chinchona Plantations, the former with a Resident Engineer and three European Road Surveyors, and employing coolies at present to the number of some 2 or 300, which number, however, the Resident Engineer is desirous with the immense works now on hand to increase as rapidly as possible, if possible even up to 3000, the latter Government Chinchona estates, employing at present one European Superintendent with a European Assistant and above 100 coolies, which both in its European and Native elements will probably be double or triple before long. Here then we have a vast body of some six or eight thousand Natives and near a hundred Europeans without any Medical aid on the spot, and with one available nearer, than Ootacamund or Manantoddy, the one 22 and the other 60 miles distant, and even these sources of aid very precarious ones, as in the monsoon the rivers in both directions rise so high as to render communication often dangerous, and sometimes even impossible. Under these circumstances, I feel that I should be but ill-discharging the duties imposed upon me by my recent visit to the place, if I did not clearly lay before you the necessity for such an institution, and urge the expediency of its being speedily brought to the notice of Government, so that steps may be taken in the matter, before another fever season comes round to decimate the population once more, as may, in the ordinary course of events, be anticipated about March or April next, not that it is likely to recur again in so severe a form, as up to the present year it had been steadily discussing during the past decade, but still the occurrence of more or less fever at that time amounts to a certainty.

9. Anticipating a favourable reception to this suggestion, I proceeded when there, in company with Mr. O'Shaughnessy, the District Engineer, to fix upon a favorable site for the erection of such a building, and found one admirably adapted to the purpose at the central southern angle of the village (the main street running off from this point towards the north-east on the one side, and the north-west on the other), immediately in the rear of which is a small piece of table-land, elevated without being exposed, and sheltered at the back by a somewhat conical hill from the violence of the south-west monsoon coming down from that quarter. The table land too being of small size, the building, while still immediately adjacent to the town (I might almost say in it), would nevertheless be sufficiently distinct and isolated for all practical and sanitary purposes; the drainage also would be natural and easy, the building facing about north north-east.

10. As regards the funds for the support of a Dispensary. Admitting, as is usual, the building, subordinate, and medicines to be found by Government, I do not think any difficulty would be likely

to arise, for (though unfortunately owing to the absence of many of their number, I was unable to consult as many of the planters on this point as I should have wished) on my explaining the probable nature and extent of the expenses, the general feeling seemed to be, that the amount would readily be forthcoming; this, therefore, need not prove a hindrance to its sanction. In concluding this portion of my subject, I will only add, that if from causes with which I am unacquainted the establishment of a Dispensary should prove inexpedient, I would suggest the desirability of a medical subordinate with an adequate supply of medicines being stationed there in any case, to afford some sort of aid to so large a community in cases of sudden and serious illness.

11. As regards then the causes of this fearful epidemic, I have already discussed the three principal, viz., natural situation and climate, which is of course but little capable of amelioration, and excessive vegetation, and those connected with the disease and slaughtering of cattle which might on the contrary be materially influenced by ordinary sanitary measures. It only remains for me therefore, to notice two others to which many attach importance, viz., the seeding and death of the bamboo, which here, however, was inoperative, as though occurring in all the surrounding country, it was not going on in the Goodaloor valley; and lastly, the effect of the felling of timber, clearing, &c. On this point I hesitate to give any decided opinion. In Wynaad the bulk of evidence would seem to prove that the first year after extensive fellings, fever is generally severe, and in Goodaloor the fellings the preceding year had certainly been very large; whether therefore or not, leaning to the idea, as I am myself disposed to do, that it is a temporary producing, but an ultimate destroying, agent of fever we must admit that, in this instance at least, whether due to this or other causes, still fever followed felling.

(Signed) R. E. PEARSE,
Civil Surgeon, Malabar.

CALICUT, *September 1864.*

From G. A. Ballard, Esq., Collector of Malabar; to the Honorable A. J. Arbuthnot, Chief Secretary to Government, Fort Saint George, dated Calicut, 26th December 1864, No. 167.

I have the honor to report that I have this day received a note from Mr. Minchin of South-east Wynaad, forwarding a list * of subscriptions likely to be received towards providing Medi-

* Copy subjoined.
cal assistance to the people about Goodaloor.

2. I would suggest that a substantial temporary shed be at once erected. I imagine all that is necessary might be done for Rupees 500* or 600, and that a good Apothecary or Dresser be provided by Government with a supply of medicines, to meet the wants of the present season : menial attendance, and dieting of in-patients would be met by the subscriptions promised and others probably payable.
- * Say Rupees 250 is subscribed by the residents—Government may be pleased to allow Rupees 250.
3. Probably Rupees 1,000 will be forthcoming for a permanent building. I trust Government will be pleased to sanction what more may be required to provide one, and will direct the submission of a plan and estimate so that the work may be commenced after the moonsoon of 1865.
4. It is probable that about Rupees 500 per annum, in the shape of local subscriptions, will be available for the current wants of the Dispensary.

ORDERS THEREON, 24th January 1865, No. 93.

In the reply made by His Excellency the Governor to the address presented to him by the Planters of South-East Wynaad on the 27th September last, His Excellency intimated, with reference to the allusion made therein to the want of a Dispensary at Goodaloor, that in the event of the residents raising contributions for the establishment of a such a Dispensary, the Government would be prepared to aid them with a liberal grant.

2. The Magistrate was subsequently instructed (in the Proceedings of Government under date 11th November 1864) to report the result of an inquiry which he had instituted, with the view of ascertaining to what extent the residents of the locality and neighbourhood would be willing to contribute towards the establishment of a Dispensary. Mr. Ballard has now submitted a list of subscriptions amounting to Rupees 215 for a temporary building, Rupees 825 for a permanent one ; and Rupees 400 per annum for the current expenses of the Dispensary.

3. The Governor in Council directs that the Magistrates will take steps for the immediate erection of a substantial temporary shed at a cost not exceeding Rupees 600, of which Rupees 385 will be contributed by Government. Orders will be issued in the Department Public Works for the preparation of a plan and estimate for a permanent Dispensary. The Governor in Council further directs that an Assistant Apothecary, or 1st Class Dresser, as the Principal Inspector General of the Medical Department may deem most expedient, may be stationed at Goodaloor ; and a supply of medicines furnished with as little delay as possible. The other expenses of the Dispensary will be met from the local subscriptions.

4. The Magistrate will give his attention to the suggestions

made in the 6th and 7th paragraphs of Dr. Pearse's report. The Sub-Magistrate will probably have no difficulty in inducing the residents to keep the ground clear in the immediate vicinity of their houses. It is presumed that a village slaughter-house may be erected at a very moderate cost. The Magistrate will arrange, in communication with Mr. O'Shaughnessy, for its immediate erection in a suitable site ; and will then prohibit, as a nuisance, the slaughtering of cattle elsewhere within a reasonable distance, say two miles of the Sub-Magistrate's Cutcherry.

5. Dr. Pearse is authorized to draw the usual travelling allowance for his journey to and from Goodakoor.

Madras Apothecaries' Society.

We are requested to submit the following brief statement of the Proceedings of the Madras Apothecaries' Society since its formation :—

On the 30th May 1864, a Memorandum was circulated among most of the Warrant Medical Officers, resident at Madras, effective and pensioned, proposing the establishment of a Society similar to the one which was in existence some twelve years ago, and requesting all who were so disposed, to become Members ; notice at the same time was given that a Preliminary Meeting would be held at the Medical College, by permission, at 6-30 P. M., on the 10th June, when all the necessary arrangements regarding the future working of the Society would be fully considered.

In consequence of the inclemency of the weather, the Meeting was postponed to the 18th June, on which evening certain Rules were framed and afterwards circulated to the Members who were not then present.

At a Meeting held on the 8th July, some of these Rules were modified, and they now stand as in the Appendix. On this occasion a paper was read, headed " Proposed plan of Working of the Association " an abstract of which was printed for circulation among the Members of the Service in the Mofussil.—A copy may be found at the conclusion of this notice.

Further, it was proposed that one of the Members (Mr. Harvey) should peruse carefully all the periodicals and recently published works within his reach, and should draw up abstracts of, or direct the attention of the Society to, all improvements or other novelties in medicine and the allied sciences, (Vide clause 2 of Plan of working.)

In accordance with clause 4 of the *Plan of Working*, it was agreed

that the subject for discussion at the following Meetings was to be "Cholera, its Etiology—prophylactic and therapeutic management."

At the first business Meeting of the Society (28th July), the following address was delivered by one of the members.

GENTLEMEN,—In accordance with almost universal practice, it has been deemed proper to inaugurate our newly founded Society with the customary formality of reading an Address, at the first business-Meeting of its members.

In carrying out this object, however, I do not intend to take up your time with irrelevant remarks or far-fetched observations, but to speak to the purpose as I may be able ; sincerely hoping, that the few words which I shall say, will be such as you may spare time to listen to, and trusting that *brevity* may not be the only recommendation of this Address.

To express the wish that somebody else had been selected, and to premise my own inability to do justice to the occasion, and so forth, in the usual stereotyped language of Addresses, shall be passed over as unnecessary. We shall take both for granted, and proceed at once to our subject.

The main object of all Associations or Societies, no matter of whom composed or how designated, is either mutual benefit, or general good of some description—to achieve, in fact, by *combination*, what isolated individuals can seldom accomplish. In no calling or walk of life is this mutual-benefit system more useful or necessary, than in the medical profession.

If we consider the responsibilities of medical men, their many and extensive opportunities for doing good to all around them ; if we look at the toils, the perils, the anxieties which fall to their lot ; if we contemplate the intimate relation between their duties and all that is terrible, painful, horrifying and dangerous—their hand-to-hand encounters, as it were, with disease and death—we shall readily perceive how valuable, if not even *necessary* to them, all such Institutions must be, especially in this vast and semi-civilized country.

The Medical Society we have now fairly started, is intended not only to afford opportunities to the Apothecaries of our service, for professional improvement and general scientific study ; but to beget and perpetuate a sort of fraternal feeling (much to be desired), amongst the members of the service.

It is a well-known fact that much good in sundry ways has resulted, to both the public and the profession, by the formation in different countries of Medical Associations, and though this feeble attempt of a few individuals in the humbler stations of life, not in anything like "easy circumstances," and with little or no influence, may not in these enlightened days be looked upon with favour or

encouragement, we may still, if we will but steadily persevere, find sufficient cause to look hopefully on the future ; numbering as we do, even in the infancy of our career, some stout hearts and strong hands, whose energetic spirits will not be easily daunted in any praiseworthy undertaking.

Possibly our " day of small things " may be so unproductive and unpromising, as not to entitle our's to be considered as even a faint imitation of other Societies, but we need not be disheartened thereby. We may still, in our own unpretending and quiet way, do much towards the mutual improvement of our Members, and the advancement of the public good ; and thereby deserve the respect and esteem of all good men.

Though we count but few Members as yet, let us not despair of success. The little leaven does not at once, nor sensibly leaven the lump—but slowly, though not the less certainly—and ere it does so in our case, we, no doubt, both individually and collectively, shall have many a mountain of difficulty to climb ; and perhaps, too, many a valley of dejection to descend. But if these are to daunt us, I will in all candour say, we deserve failure. Moreover, if we do not bear constantly in mind the objects of the Society, and lend our best aid persistently and willingly, it would be much wiser to let it die out at once—even now. But our hopes are stronger than our fears.

" 'Tis not in mortals to command success,
But we'll do more we'll deserve it."

" Good actions crown themselves with lasting bays,
Who deserves well needs not another's praise."

There is a yet higher motive than the esteem of our fellows, which should actuate us in this undertaking, viz., the duty we owe no less to God, than to our fellowmen and ourselves. We entered upon the important and responsible functions of the medical profession—it may have been of our own free will and choice, or of accident, or of pressure which we could not at the time resist—we are nevertheless fairly in the ranks of the profession now, placed there by the guiding hand of Providence, and must perform faithfully, honestly, disinterestedly, and to the best of our ability, the duties which devolve upon us. We need to be reminded that we are moral agents, entrusted with certain *talents* which we are bound to use well, that we may render a good account. We cannot certainly reckon amongst *our talents*, rank, or wealth, or power ; nor is it necessary we should. We have intellectual faculties ; we possess some amount of professional knowledge, the result of careful training (thanks to a liberal and benevolent Government) ; can exercise some degree of influence, such as it is, on those around us ; and we have energy, though we bear blame very often for lacking it. These are our talents to be improved. They were not bes-

towed upon us for mere use, but for improvement too ; nor for selfish uses, but for the benefit of mankind and the glory of the all-wise Benefactor. Let ours then be a "FINISHED" work in respect to the employment of time and talents.

Yes, I admit, that we occupy but a very inferior position, speaking only in reference to official status in the service. Let us not be ashamed and remain inactive, because we are in a humble sphere ; but let us strive to be useful and deserving in that position. Every man has his place, and every place its occupant. If we keep ours with honor and credit, we do well.

"From lowest place when virtuous things proceed,
The place is dignified by the doer's deed."

"Honor and shame from no condition rise ;
Act well your part, there all the honor lies."

We are not expected, you will say, to be possessed of high professional attainments, because seldom required to use them. But can any amount of professional knowledge be too much for the exigencies which do sometimes arise ? Such indeed are the duties of a medical man generally, no matter how humble or how exalted his position, that he may, at any time, and under most trying circumstances, find himself bound to incur responsibilities, which it would behove him to know well how to discharge, and if he happen not to be equal to the emergency, woe betide his unfortunate patient : and he himself may long regret his shortcomings, and mourn over his deficiencies, which it would be of no avail to attempt to extenuate by saying that he had never prepared for such emergencies, because he is seldom required to undertake them. Pray, what excuses would suffice to quiet an accusing conscience, or to soothe the harrowed feelings of the friends, in such a case ?

Granting, too, that we may never be placed in responsible charge, that we shall always continue to perform no other than the minor and comparatively unimportant duties of a dispensary, would it not be well and wise to keep up and improve our knowledge of these duties, progressing with the times ? What more conducive then, to this object, than a Medical Society, well managed and in active working ? Our work in hospital and dispensary should not consist of *manual* labour only, but of *mental* also.

There is no disguising the fact that, constituted as our natures are, we soon grow weary even of well-doing, if there are no substantial pecuniary returns for work ; but, whether right or wrong, natural or not, this is no reason for relaxing our efforts in the path of duty. At all events, we may be quite certain that we can expect no pecuniary gains except we earn them ; and having laboured for them (if haply we do so in vain), we may still fall back upon the consolation that our duty has been discharged to the best of our

ability, and our ability to do it has been improved to the best of our opportunities.

“ Who born so poor,
Of intellect so mean, as not to know,
What seemed the best ; and knowing, not to do ?
As not to know what God and conscience bade,
And what they bade not able to obey.”

To enumerate all the advantages likely to accrue from Medical Societies would be simply impossible, and to attempt it an unnecessary waste of time ; but I may be permitted here to mention some—for instance, the constant stimulus to study ; the many opportunities of acquiring useful knowledge, by bringing together, as it were, the experiences and readings of many individuals ; the spirit of emulation which must necessarily be engendered ; the feeling of confidence in practice which must result, and make us *au fait* at our work ; the acquisition of self reliance in writing and public speaking, and the improvement of habits of systematic study and observation. There are some drawbacks it is true, which, by reason of small means and widely scattered residences, we must encounter ; but they are trifles in comparison—mere inconveniences on the one hand, and considerable professional, social, moral, and intellectual advantages ; and it may be even pecuniary gain on the other.

Looking also at the slight acquaintance we, in many instances, have with one another, I should say that the institution of a Society like this is *not simply* advantageous to us, but an absolute *necessity*. We undoubtedly need it very much, apart from all other considerations, to make us more intimately acquainted with each other and to generate laudable feelings of sympathy and brotherhood.

Other Societies have, ere now, had existence amongst us, but were very short-lived. The first, organized some twelve years ago, with praiseworthy zeal and energy by some of the members now present, lasted for about two years, and maintained a Medical Journal of no mean pretensions and merit. The next scarcely existed a few months.

It is needless to enquire into the causes of their decadence. Enough for us is the care and support of the infant we have now launched into life, and are expected to nurture into maturity.

We shall most probably avoid discomfiture in this our undertaking if we will but adhere to a very simple plan, and eschew, as much as possible, all *formality*, and, in fact, make our meetings wear more the appearance of social gatherings, discussing, *visd voce* only at first, if members so choose, all questions which may be started of a scientific nature connected with Medical literature. It will perhaps be said that by this mode many of our meetings must be barren and useless—nay, they *cannot* be so. There may not be much *said* or *done* in a *professional* way, but there will

be a good deal *gained* in *other* ways ; and, as we progress, and individuals begin to wear off the feelings of reserve and diffidence, we shall see them coming forward on topics of interest and usefulness, even as in other similar Societies.

There will surely be no lack of subjects for discussion and study in the diseases peculiar to India ; the drugs procurable in the country ; the undeveloped resources of this vast land—besides which there are many popular Medical errors to be corrected, and prejudices to be overcome, and eradicated.

Having said so much about the *ways*, let us now glance at the *means* for maintaining the Society. We begin with small monthly subscriptions, just enough to enable us to pay for lights, writing materials, and the salary of a peon to go about with papers. By and bye we hope to be able to see our way clearer to, perhaps, getting English and other Medical periodicals, and to printing our own “transactions”—augmenting the rates of subscription gradually as we go on, of course—later still, we may be in a position to start a Medical periodical of our own again, and with the increase of our means, which by that time will have accumulated, we shall be able to get all our other wants supplied. I fancy I hear you say that I am too sanguine in my expectations, and looking much too far into the future. We certainly *may* accomplish all these objects ; and doubtless shall, if we will but work with *energy* and *unanimity*.

“Lives of great men all remind us
We can make our lives sublime,
And departing, leave behind us
Footsteps on the sands of time.”

“Let us then be up and doing,
With a heart for any fate,
Still achieving, still pursuing,
Learn to labour and to wait.”

The Address was most warmly received by the Members present. Mr. J. J. Wood then read a paper on “Dog bite and Hydrophobia,” a subject which has recently excited much attention in Madras, as the nuisance of vagrant dogs is becoming almost intolerable. We re-print Mr. Wood's contribution, at p.p. 343 to 353 of this volume.

The discussion on the Etiology of Cholera next followed. This was initiated by Mr. R. Wilkins, who read a paper, embodying in some detail, his belief on that subject grounded on a knowledge of the relationship between nerve-force and electricity.

In consequence of the state of the weather, the Meeting which should have been held on Thursday, the 11th August, was postponed to Saturday the 13th.

On Saturday the 13th August the discussion on the Etiology of Cholera was continued.

At the Meeting on Thursday the 25th August 1864, Mr. Wood read

notes of a case of Hemiplegia (treated by the late Dr. Magrath in 1850) occurring in a Rajpoot Sepoy *Æt.* 28 : plan of treatment pursued. Calomel to ptyalism, preceded by active purgation, blisters to occiput and nape of the neck, followed by stimulating embrocations to the affected side. Recovery perfect. Discharged for duty two months and two days after admission.

The discussion on the Etiology of Cholera was concluded on this evening.

On Thursday the 8th September, Mr. R. Harvey, read an abstract of all that had been published by Professor Simpson and others on Acupressure.

A conversation on the prophylactics of Cholera concluded the Meeting.

Rules of the Madras Apothecaries' Society.

1. That a Society be formed from among the Warrant grades of the Medical Department, to be designated **THE MADRAS APOTHECARIES' SOCIETY.**

2. That the Society (composed exclusively of Warrant Medical Officers) consist of Members, a Secretary, and Treasurer. The Secretary and Treasurer to be elected annually.

3. That permission having been granted to the Society, by the Principal of the Medical College, to hold its Meetings at that Institution, the Members will accordingly meet there on the second and fourth Thursdays of every month.

4. That the Society meet, oftener if necessary, and that, at all meetings, one of the Members be elected Chairman.

5. That Warrant Medical Officers in the Mofussil be invited to co-operate with the Presidency Members, by forwarding Papers on professional subjects, which Papers the Secretary will take the earliest opportunity of reading at the Meetings.

6. That Proceedings of Meetings be published periodically (if funds admit of it) and forwarded to the senior Subscribers at the different divisions of the Army for distribution.

7. That Members subscribe Four Annas monthly, to be paid in advance.

8. Donations and other gifts which the well-wishers of the Association may choose to offer, will be thankfully accepted and acknowledged.

The following is the plan of working of the Association.

1. Reading of *original* Essays on various subjects in Medicine and the collateral Sciences.

2. Reading of Papers, from Periodicals and recently published Works, on subjects new to the Profession.

3. Reading of detail statements of instructive and interesting cases.

4. Discussions or Conversations on professional subjects, as agreed upon from time to time by the Members.

5. Lectures or Discourses, single or successive, in special departments of study.

6. Exhibitions of Anatomical or other Drawings, Original Diagrams, Models, Instruments, Drugs, &c.

List of Subscribers to the Madras Apothecaries' Society.

Messrs. R. Hufftoun, J. Tyrrell, A. Grove, G. O'Hara, R. Barrow, J. Gorman, G. Fox, R. Avers, C. Oliver, A. Spiers, T. B. Turnbull, J. J. Wood, *Secretary*, R. Harvey, F. Menead, R. Wilkins, *Treasurer*, H. Wale, J. O'Flynn, T. K. Hall, P. Wynne, A. Wright, C. T. Browne, F. Brown, J. Ward, H. Boon, G. Norton, H. H. Lynsdale, P. Kinsley, W. J. Lincoln, J. Walker, H. Whitwell, P. Heron, W. D. Stewart, E. Atkinson, C. A. Vint, F. B. S. Newland, G. Brown, G. Fonsworth, T. S. Judge, G. W. Phillips J. O'Keeffe.

Mortuary Reports of Madras.

By W. R. CORNISH, *Secy. Principal Inspector General, Medical Department.*

I.

Quarterly Report on the Mortality of Madras for the months of January, February and March, 1864.

The public health in Madras during the first quarter of 1864 has not been so satisfactory as could be desired. The total number of deaths have been less than in the corresponding quarters of 1862 and 1863, both particularly unhealthy seasons, but above the average of the previous nine years. The deaths for the various quarters are as follow :—

1st Jan. to 31st March....	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864
Number of deaths.....	2939	2923	2242	2357	3688	2373	2309	3912	3783	3125

The deaths from Miasmatic causes have been slightly below the average. Small-pox and cholera were less fatal than is usual at this season of the year, but fevers and dysentery caused rather more deaths than ordinary. The weather for Madras has been cold and pleasant. No rain fell during the quarter.

2. The most noticeable feature in regard to the deaths occurring in the quarter is the rather high mortality of Europeans and East Indians. Of Europeans there were 54 deaths against 59 in the corresponding quarter of 1863, and of an average of 35 in the previous nine years. Of these 54 deaths, 14 were due to cholera, 7 to diarrhoea, 2 to dysentery, and 1 to small-pox.

3. The deaths of Europeans is much influenced by the condition of the troops in Garrison. It should be noticed that troops newly arriving in the country are often more prone to suffer from

tropical diseases than those who have become accustomed to the country. H. M.'s 76th Regiment arrived at Madras early in the year, and some scattered cases of cholera have prevailed amongst the Military. Of the total of 54 deaths during the quarter, 13 have occurred amongst the troops and families of soldiers in Garrison and in the Garrison Hospital, while 41 have occurred amongst the Civil European population, including pensioners and sailors.

4. Amongst the casualties from cholera may be mentioned the cases of S. Collins, Armourer Serjeant, and his wife, who lately came out by Overland route for duty in Madras. Having nobody to guide or advise them on landing in Madras, they took up their abode in an unhealthy part of Black Town. The woman was first taken ill in "John Pereira's," and subsequently treated in the General Hospital, where she appeared to be recovering, but a sudden relapse on the 6th day occurred, which proved fatal. The husband up to this time had remained well, but the shock of his wife's death seemed to overpower him, and he was taken ill almost immediately after the funeral with cholera, and died the next day. The Medical Officer is of opinion that "had there been open, airy, and healthy quarters available for these people on arrival, they might have been alive now."

5. A local but very fatal outbreak of cholera occurred in New Town during the last days of February and beginning of March. It was for the most part confined to East Indian families in Naval Hospital and Ootacotum Streets. The chief peculiarity of the attack was its suddenness, and great fatality. Of the cases attacked nearly all died; 26 deaths occurred in and about New Town, and not more than three or four persons who were attacked recovered.

6. The circumstances connected with this outbreak, so far as I can learn upon inquiry of those who lost friends and relations on the occasion, are much as follows.

7. It seems that a Hospital cooly of H. M.'s 74th Highlanders (that corps having at the time cholera cases in camp) was in the habit of coming home of nights to his hut in New Town. A servant to the Quarter Master Serjeant of 2nd Regiment N. I. lived in the same hut or house with this cooly, and therefore the chain of communication between the cholera camp and the house in New Town, where the first case occurred, may be regarded as complete. A child of the Quarter Master Serjeant's was taken ill on the night of the 27th, another on the 28th, and both died. On the latter date the wife and child of the Serjeant Major of the regiment, living close by, were attacked and died, and from this time the other cases followed in rapid succession. It seems that the servant boy had come to the Quarter Master Serjeant's house late at night on the 27th, and that almost immediately after, the first child that was attacked began to sicken.

8. The curious thing, however, in regard to the communication of the cholera poison in this case was, that neither the Hospital cooly, nor the Quarter Master Serjeant's servant, nor a woman living in the hut, had any symptom of the disease.

9. The two former appear to have been the unconscious media of communication of the disease between the camps at Guindy and Palaveram, and the house in New Town.

10. It should be added that the sanitary state of the neighbourhood was, and had for a long time past, been most defective; some of the worst nuisances have since been remedied on the representation of the Deputy Inspector General, Presidency, but the locality will always be liable to bad outbreaks of cholera, until the overcrowding is relieved, and a better system of couservancy established.

Deaths in Madras, first quarter of 1864.

	Euro-peans.		East Indians.		Hindoos.		Mahomedans.		Total.		Grand Total both sexes
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
<i>Miasmatic Diseases</i>											
Small-pox.....	1	...	2	...	45	8	3	...	55	53	108
Measles.....	...	...	...	...	1	...	...	...	1	3	4
Fevers.....	...	...	...	...	278	266	34	29	314	297	611
Dysentery.....	2	...	3	...	140	151	19	33	164	186	350
Diarrhoea.....	3	4	2	4	105	83	7	8	117	99	216
Cholera.....	9	5	10	17	118	123	32	35	169	180	349
Total of Miasmatic diseases.....	15	9	24	27	686	669	95	113	820	818	1638
Total of all other diseases.....	23	7	29	29	627	502	142	128	821	666	1487
	38	16	53	56	1313	1171	237	241	1641	1484	3125
<i>Mean Mortality of nine First Quarters from 1855 to 1863.</i>											
Miasmatic Diseases.....	12.6	2.8	16.1	16.1	768.5	687.5	132.0	145.8	929.2	852.2	1781.4
Other Diseases.....	15.2	4.9	16.4	18.6	517.6	477.8	86.6	84.7	685.8	586.2	1222.0
	27.8	7.7	32.5	34.9	1286.1	1165.3	218.6	230.5	1565.0	1438.4	3003.4
<i>Increase or Decrease.</i>											
Increase.....	18.5	...	41.6	...	32.6	...	29.9	...	.....	.....	121.6
Decrease.....	...	...	...	...	...	...	...	...	.....	.....	...

II.

Quarterly Report on the Mortality of Madras for the months of April, May and June, 1864.

The public health in Madras, during the 2nd quarter of 1864, has continued to be singularly good. The season has been cooler than usual. Owing to the lateness of the South-west monsoon, there has been scarcely any hot land-winds. No appreciable quantity of rain has fallen during the quarter.

2. The great healthiness of the season is shown chiefly in the diminished mortality from Miasmatic causes. The average number of deaths in nine similar periods registered under this head was 1,275, and in the last quarter they numbered only 1,073. Small-pox caused 59 deaths, measles 4, fevers 481, bowel complaints 477, and epidemic cholera was fatal in only 52 instances. For upwards of a year the town has been singularly free of the latter disease. In the quarter under review, several weeks have gone by without a single case appearing in the Returns.

3. I may repeat again here the warning given on a former occasion, that there is no reason to suppose that this immunity from cholera is due to the better sanitary condition of the people, as regards their homes and habits. A large proportion of the population still use impure drinking water, and reside in an atmosphere fouled by exhalations from decomposing sewage, and soil supersaturated with filth. The conditions which favor the development of the cholera pest, still exist over very wide areas within the town limits, and so long as they do exist, the population must expect to be visited now and again by destructive epidemics. The re-importation of cholera, supposing the climatic conditions to be favorable to its spreading, may certainly be expected to occur at no distant date, and the town will be no better prepared to avert the scourge than it has been any time during the past 40 years. It is only right that this fact should be clearly appreciated, while we are congratulating ourselves upon the present satisfactory condition of the public health.

4. Although prices of provisions have been ruling high at the Presidency, they have not attained the famine rates we hear of in many parts of the Mofussil. Wages have kept pace pretty fairly with the increased cost of living, and the demand for labor is such that no man who is able and willing to work need starve.

The great bulk of the laboring population are now able to procure for themselves a sufficiency of food. Half-starved and emaciated coolies are seldom seen in the streets; as regards *physical* condition the population is well fitted to withstand the onslaughts of epidemic disease, and in this respect there is reason to hope that when cholera again appears amongst us it may claim fewer victims than usual.

5. The deaths amongst the European community have been higher than usual at this period of the year. The population as is

well known is a fluctuating one, and during the quarter some additions to the casualty list have been caused by the newly introduced practice of receiving Military invalids from the Mofussil, or from Foreign service into the General Hospital, Madras, instead of sending them to the Poonamallee Depôt.

A closer examination of the European casualties of the quarter show them to have occurred amongst the following classes:—

Military (including children of soldiers).....	25
Civil (including Military Pensioners).....	18
Seamen.....	5

Total... 48

6. The total number of deaths amongst the various classes during the past quarter were as follows:—

	Euro- peans.		East Indians.		Hindoos.		Mahome- dans.		Total.		General Total of both series
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
<i>Miasmatic Diseases.</i>											
Small-pox.....	...	...	...	1	24	18	6	10	30	29	59
Measles.....	1	...	...	1	2	...	...	...	4	...	4
Fevers.....	3	2	...	5	206	198	41	26	250	231	481
Dysentery.....	4	1	...	1	74	104	22	38	100	144	244
Diarrhoea.....	5	...	...	3	100	91	17	17	122	111	233
Cholera.....	3	1	...	...	17	13	13	5	33	19	52
Total of Miasmatic diseases.....	16	4	1	10	423	424	99	96	539	534	1073
Total of all other diseases.....	24	4	21	18	537	476	143	126	725	624	1349
	40	8	22	28	960	900	242	222	1264	1158	2422
<i>Mean Mortality of nine 2nd Quarters, from 1855 to 1863.</i>											
Miasmatic diseases...	8.7	2.7	15.6	14.8	571.5	521.4	68.3	72.1	664.7	611.0	1275.1
Other diseases.....	15.4	5.4	20.7	19.5	513.8	468.7	91.5	94.7	641.4	588.3	1229.7
	24.1	8.1	36.3	34.3	1085.3	990.1	159.8	166.8	1306.5	1199.3	2504.8
<i>Increase or Decrease</i>											
Increase.....	15.8	...	...	20.6	...	...	187.4	...	...	...	...
Decrease.....	...	...	...	...	215.4	...	...	...	...	...	82.8

III.

Quarterly Report on the Mortality of Madras for the months of July, August and September, 1864.

The third quarter of the year in Madras is generally remarkable for an increased mortality from diseases of an epidemic character. The period which has just closed has not been characterized by any increase in the proportion of deaths. With the exception of a few cases of cholera in August and September, the population has been remarkably free from epidemic diseases.

2. The deaths amongst the European portion of the community have been rather higher than is usual at this season of the year. Of these, 21 occurred amongst the Military residents, including the wives and children of soldiers, and 23 amongst the Civilian residents, including Military Pensioners and their families. Five deaths occurred amongst seamen visiting the port.

3. On the whole, the proportion of deaths from Miasmatic diseases has been much below the average, and this circumstance in itself must be regarded as satisfactory evidence of the general salubrity of the town during the past quarter.

Deaths in Madras, third quarter of 1864.

	Europeans.		East Indians.		Hindoos.		Mahomedans.		Total.		General Total of both sexes.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
<i>Miasmatic Diseases.</i>											
Small-pox.....	...	...	...	...	2	...	1	...	3	...	3
Measles.....	...	...	...	1	...	...	...	...	...	1	1
Fever.....	4	3	2	4	227	190	29	39	262	236	498
Dysentery.....	3	...	1	3	105	99	20	26	129	128	257
Diarrhoea.....	2	2	4	3	93	90	17	16	116	111	227
Cholera.....	1	...	2	2	54	61	10	9	67	72	139
Total of Miasmatic diseases.....	10	5	9	13	431	440	77	90	577	548	1125
Total of all other diseases.....	22	12	31	25	552	446	127	110	732	593	1325
	82	17	40	38	1033	886	204	200	1309	1141	2450
<i>Mean Mortality of nine 3rd Quarters, from 1855 to 1863.</i>											
Miasmatic diseases.....	12.7	4.7	15.7	20.5	684.3	634.1	111.5	106.0	824.2	765.3	1589.5
Other diseases.....	14.2	6.5	24.0	24.6	529.2	499.4	104.1	91.3	671.5	621.8	1293.3
	26.9	11.2	39.7	45.1	1213.5	1133.5	215.6	197.3	1495.7	1387.1	2882.8
<i>Increase or Decrease.</i>											
Increase.....	10.9	...	...	...	...	...	...	...	...	...	...
Decrease.....	...	...	6.8	...	428.0	...	8.9	...	...	...	432.8

Annual Report on Vaccination for 1863.

[Addressed by JAMES SHAW, Esq., Officiating Principal Inspector General, Medical Department, Fort St. George ; to the Honorable A. J. ARBUTHNOT, Chief Secretary to Government, Public Department, Fort St. George.]

SIR,—I have the honor to forward, for the information of Government, the returns of the number of persons vaccinated in the Madras Presidency and Mysore, for the year 1863, with extracts from the reports of local Superintendents, showing the working of the present system of Vaccination.

2. According to the returns, the total number of persons vaccinated during the year was 3,18,824, being an increase of 6,050 over the numbers of the previous year, but less than the average of the previous five years. Of the total number of operations 26,745 were unsuccessful. The proportion of successful cases was 83·8 per cent.

3. The cost of the department has been augmented during the present year by the inclusion of the pay and allowances of two Sub-Assistant Surgeons employed in superintending Vaccination in the districts marginally shown. The reports of these officers, which are freely quoted from, testify very plainly to the difficulties in the way of making Vaccination popular amongst the Native portion of the population.

4. There can be no doubt that the operation itself is not favorably regarded by the bulk of the people, but in this respect they are probably no more prejudiced than are the poor and ignorant in Great Britain, who neglect to have their children vaccinated, unless compelled thereto by law and the infliction of penalties for breaking it.

5. Small pox prevailed epidemically on the Western Coast and in various parts of the country. It is difficult to get at the truth regarding the fatality of this disease. From recent correspondence and investigation on the Western Coast, it seems that the statements of village authorities, as to the number of attacks and deaths, during epidemic seasons, are altogether unreliable.

In the province of Malabar, it is customary with the people to turn the wretched victims of this malady out of doors, to live or die, according to the mildness or violence of the disease. Small pox Hospitals now exist at Calicut and Cochin, for the reception of those who have been so mercilessly cast adrift. But considering the unusually violent nature of the disease on the Western Coast, it becomes a question whether this practice of turning the affected out

into the public streets should not be prevented, if possible, by Legislative enactment.

6. In the Presidency town and immediate neighbourhood, there was comparatively little sickness from small pox. The deaths in Madras numbered only 112, against an average of 576 in the five previous years.

7. The lymph generally in use has been of good quality. In transmitting supplies from the Presidency depôt, the Superintendent is now instructed to use only capillary tubes, of which a supply has been obtained from England.

Lymph transmitted in this way is found to retain its powers longer than by any other method. At Chicacole the lymph was reported to be inferior, but Dr. Cooper, the Deputy Inspector General of the Division, states of the other stations in the Northern Division that it has been genuine.

8. Dr. Shortt, as usual, has made a long tour of inspection through his district, and his report is on the whole favorable to the general truthfulness of the returns of the Vaccinators, a result unquestionably due to their being aware that at some uncertain period they would be inspected by Dr. Shortt. The zeal exhibited by this gentleman is most praiseworthy. Government will notice also that Dr. Shortt has succeeded in introducing Vaccination amongst the Yenadies, and jungle tribes inhabiting the district.

9. Various Medical Officers complain of the difficulty of getting the mothers of children to accompany the Vaccinators from village to village, and there is much reason to suppose that the unpopularity of allowing lymph to be taken from the ripe vesicle, depends much upon the trouble and inconvenience which the practice occasions to the parents. The only way of vaccinating on a large scale is to use the lymph perfectly fresh—vaccinating from arm to arm. To enable the operators to carry out their instructions in this respect it is necessary to subject the parents of a few children to the inconvenience of moving to a neighbouring village, and it is only right that these persons should be sufficiently remunerated for their trouble. At the Presidency town this is a serious difficulty, the people it appears not being compensated for their trouble. In some Collectories a regular rate of batta is allowed. I would venture to propose for the sanction of Government, that Vaccinators should be authorised to pay on some such scale as the following, recovering on contingent bill, countersigned by the local Superintendent.

To a woman for taking a child to a neighbouring village, the distance not being more than two miles from her residence, a gratuity of.....Eight Annas.
For a distance of four miles.....Ten Annas.
And an Anna additional for every mile.

10. Amongst the measures suggested for the extension of Vaccination, some Officers appear to hold to the view that it must be made compulsory to be of real use to the people. Vaccination left to the voluntary efforts of the people is certainly making no real progress. The unwillingness of candidates for the public service to submit to the trifling annoyance of the operation is testified to by more than one of the Medical Officers.

11. The correspondence which took place last year with regard to the vaccination of those educated in Government Schools led the Government to concur with the Director of Public Instruction, that the course proposed did not appear at present to be advisable. In common with many Medical Officers of the department, I hold the opinion that no person in any way connected with the Government Service, or receiving education in Government Schools, should be permitted to endanger the safety of others with whom he is officially brought into contact by the neglect of this simple prophylactic.

12. I have already in my letter, No. 113, of 9th April last, gone fully into the subject of remodelling the Vaccine Department; but I may remark here, that every report from up-country shows that to arrive at any thing approaching correct results of the working of the department, a system of extended supervision is absolutely necessary.

13. I beg also to bring to the notice of His Excellency the Governor in Council, that many of the Medical Officers point out the difficulty, or rather the impossibility of getting proper candidates to keep up the strength of even the present Vaccine Establishment.

The proposed plan of employing third class Hospital Assistants as Vaccinators will meet this difficulty, but at this moment there are too few of these lads, and it will be necessary to recruit largely for this branch.

If Government will permit me, I am prepared to submit my views as to the manner in which a supply of third class Hospital Assistants can be kept up, and who will, I hope, eventually be more practically educated than those entertained upon the present system.

I have the honor to be,

Sir,

Your most obedient servant,

JAMES SHAW,

Officiating Principal Inspector General,

Medical Department.

The following Orders of Government were passed by the Governor in Council on the foregoing Report by the Principal Inspector General, Medical Department.

No. 113.

Dated, 26th August 1864, No. 978.

The foregoing Report shows that the number of persons vaccinated during 1863 was 6,050 in excess of that of the preceding year, and that of the total number of operations, viz., 3,18,824, 26,745 were unsuccessful.

2. The want, however, of efficient supervision under the present system precludes reliance in the accuracy of many of the Returns of the Vaccinators, a defect which, it is hoped, will soon be remedied by the introduction of the scheme recently recommended to the Government of India for the re-organization of the Vaccine Department.

3. The Governor in Council notices with pleasure the warm interest evinced by Dr. Shortt in the cause of Vaccination within his range, and the success of his efforts in introducing Vaccination among the Yenadies.

4. Referring to the proposal contained in paragraph 9 of the present Report, it is observed that a somewhat similar plan for extending the means of Vaccination was, in November 1854, sanctioned for general adoption. The Officiating Principal Inspector General, Medical Department, will state whether that plan has been carried out and with what result; also, what advantage the plan now submitted possesses over that which it is intended to supersede.

5. The Governor in Council will be glad to receive Mr. Shaw's views on the subject of the last paragraph of his Report.

(True Extract.)

(Signed) J. D. SIM,

Secretary to Government.

Madras Medical College.*(Proceedings of the Madras Government.)*

Read the following letters :—

From the Director of Public Instruction.....	}	Here enter 14th April 1864, No. 697.		
Do. do. do.		"	7th June	" " 1,084.
Do. do. do.	}	"	13th July	" " 1,339.
Do. President Sanitary Commission		"	11th Aug.	" " 259.
Do. Director of Public Instruction	}	"	15th Sept.	" " 1,824.
Do. Proceedings of Government, Military Department		"	26th Oct.	" " 3,791.
From the Officiating Principal Inspector General, Medical Department.....	}	"	29th Oct.	" " 374.

ORDER THEREON, 18th November 1864, No. 353.

The Governor in Council proceeds to pass orders on the Annual Report of the Principal of the Medical College, and on the several papers above recorded : all of which relate to the system of instruction followed in, or to the arrangements connected with, that Institution.

Senior Department.—2. During the Session to which the Principal's Report has reference, the Senior Department contained eight Students, one of whom passed his final examination for the grade of Sub-Assistant Surgeon at the close of the Session. This Student is reported by the Committee of Examiners to have acquitted himself very well in Medicine and Surgery, but, on all other points, to have displayed only an average amount of knowledge. The attainments of the other Students of this Department are reported on by the Professors. Five of them appear to have done well ; while of the other two, the reports are by no means favorable.

Second Department.—3. In the Second Department, only one Student appeared for his final examination ; and he passed with difficulty. Of the other Students forming this Department, the Professors generally speak in very indifferent terms. Dr. Paul says that, "with few exceptions, the numbers composing this class are "remarkably ill-educated, with vague notions regarding most subjects, even those of every-day life and occurrence." "Most of the "youths in this Department are mere school boys, who ought to be "engaged on the elements of general education, instead of Students "struggling with a scientific subject." Dr. Blacklock attributes their dullness to an imperfect supply of nutritive and varied diet. He, as well as Dr. Chipperfield, Dr. Wyndowe, and the Committee

of Examiners, advert to the great want under which the present Students labor, from not attending a Hospital or Dispensary previous to their admission into the College.

Junior Department.—4. The same remark is made by the Committee of Examiners with reference to the Students in the Junior Department, of whom 27 passed for the grade of Hospital Assistant.

5. The expediency of reverting to the system in force in former years, under which all Candidates for employment in the Subordinate Medical Department had the advantage of one or more years' preliminary attendance in a Hospital before being sent to the College, was adverted to in the Proceedings of Government under date the 25th January last ; and it is clear, from the correspondence which has since taken place, that all those who are best qualified to give an opinion on the subject are in favor of the measure. The Governor in Council accordingly directs that, in future, all Candidates for admission into the Second and Junior Departments of the College, shall, after passing the preliminary examination, be attached for a period of not less than one year to a Hospital or Dispensary ; at the expiration of which their admission into the College will depend upon their passing successfully a further examination adapted to test the practical knowledge they have acquired, and especially their acquaintance with the meaning of medical terms and consequent fitness to profit by the instruction imparted in the College.

6. In order that this measure may be partially introduced with as little delay as possible, His Excellency the Commander-in-Chief will be requested to issue orders for holding an intermediate preliminary examination at the Presidency and in the Provinces, the successful Candidates at which will be at once attached to Hospitals, until the commencement of the Medical College Session in the autumn of 1865.

7. But the above is not the only suggestion which has been made in the papers now before Government, with the view of improving the education of the Military Medical Students. In one of the letters above recorded, the Principal has re-opened the entire question of the nature of the education to be imparted to these Students, and has recommended that the four years' course of Collegiate instruction, formerly given to Candidates for the situation of Assistant Apothecary, should be reverted to, such course to be additional to at least one year's preliminary attendance at a Hospital. The Governor in Council does not deem it necessary to follow Dr. Smith through the arguments which he has advanced in favor of this proposal. The arrangement which he desires to revive was condemned some years ago after very full discussion ; and if the Assistant Apothecaries now sent out of the College are not so well prepared as they should be for the duties which devolve on them, His Excellency in Council is disposed to attribute the deficiency

rather to the want of preliminary training in a Hospital, to which allusion has already been made, than to the insufficiency of the time actually passed in the College. It is probable also that the better prospects of advancement now held out in other branches of the public service have prevented many well-educated and intelligent youths from seeking admission in the Subordinate Medical Department, who would otherwise have done so. On the first point, a remedy will be applied at once. In regard to the second, the Principal Inspector General of the Medical Department will be instructed, through the Military Department, to submit his Report on the scheme for the re-organization of the Department, which has long been under consideration, and the settlement of which should no longer be postponed. It may be noted here that the arrangements which have recently been sanctioned for the superintendence of Vaccination will materially improve the prospects of the Subordinate Medical Department.

8. Adverting, however, to the strong opinions which have been expressed by the Principal of the College on the defects of the arrangements now in force for the education of Medical Subordinates; the Governor in Council deems it advisable to submit the question to a Committee of experienced officers, who will carefully consider the correspondence which has taken place, and furnish Government with their opinion on the working of the present system, and with any suggestions for its improvement which, on deliberate consideration, they may deem it advisable to make. The Committee will consist of the Inspector General of Hospitals, who was long connected with the College both as a Teacher and as Principal; (with the permission of His Excellency the Commander-in-Chief) of Deputy Inspectors General Mackenzie and Inglis, the Director of Public Instruction, and the Principal. They will consider and report on the several points noticed in the papers recorded in these Proceedings, and in the Proceedings of Government under date the 25th of January last, No. 25, and also on any other points connected with the efficiency of the Institution, on which they may think alterations requisite. Mr. Shaw will be President of the Committee, and will arrange for its meeting at an early date.

9. The Governor in Council concurs in the opinion expressed by the Director of Public Instruction, in the 14th paragraph of his letter of the 14th April last, as to the inexpediency of introducing into the Annual Reports on the working of the College, comments on supposed defects in the organization of the Subordinate Medical Department. The Annual Report, as Mr. Powell observes, should be "confined mainly if not entirely, to a history of the progress of the College during the previous year."

(True Extract.)

A. J. ARBUTHNOT,
Chief Secretary.

[The following is the letter addressed to the Chief Secretary to Government. By the Director of Public Instruction relative to the Annual Report of the Madras Medical College.]

SIR,

I have the honor to lay before His Excellency the Governor in Council the Annual Report of the Principal of the Medical College for the year 1863-64. Appended to the Report are, among other papers, the separate Reports of the Professors upon their individual classes, and the Report of the Government Examiners upon such of the Students as appeared before them.

2. Several changes occurred in the College staff during the year under review. Mr. Mayer, whose connexion with the College embraced a period of thirteen years, was succeeded as Principal by Mr. Smith, and as Professor of Chemistry by Mr. Wyndowe. The Professorship of Midwifery and that of Diseases of the Eye were formerly held by the same officer, Mr. Smith discharging the duties of both at the commencement of the Session. Government were pleased, however, to separate the two chairs, and to appoint Mr. Aitken, the Superintendent of the Lying-in-Hospital, to the former, the latter continuing to be filled by Mr. Smith. The advantage is evident of having as Professor of Midwifery the Surgeon in charge of the Lying-in-Hospital, as such an arrangement secures every facility for the theoretical instruction afforded in the Lecture room being practically exemplified in the Hospital. Mr. Urquhart resumed his duties as Professor of Medical Jurisprudence at the commencement of the Session.

3. In the subordinate staff, Second Dresser M. Jaganatha Nayudu was succeeded in the post of Native Assistant by Second Dresser E. Ailsworth.

4. Of the three Departments into which the College is divided, the Senior, intended to educate for the post of Civil Assistant Surgeon, or for a Medical Degree at the University of Madras, contained seven Students at the close of the Session. Of these young men, one, Mr. Boalth, having completed the prescribed course, and having been declared qualified by the Government Examiners, has received the Diploma of the College. It was no doubt intended, when Universities were established in India, that no other bodies in that country should be at liberty to grant Diplomas. But, as it appeared doubtful if due notice had been given to the Students in the College, that the College Diploma would no longer be issued, Government were pleased to rule that this distinction should be left open to such Students as entered the Institution prior to the Session 1864-65. Two of the Students in the Senior Department acquitted themselves

very poorly in certain of their subjects, and appear to be considered by some of the Professors as not altogether qualified for their position ; one of them also was irregular in attendance. The Principal in his closing remarks upon these young men, observes "it is to be hoped that this public notice of their deficiencies may be the means of stirring them up to greater zeal and regularity for the future." I am doubtful whether censure is quite adequate to the wants of the case, more especially as the inferiority of the Students was noticed in the Report of 1862-63. I am inclined to think that it would be more appropriate to diminish or even withdraw for a season the Government Scholarships held by the young men.

5. The second Department which educates Candidates for the post of Assistant Apothecary, comprised one Student in the first class, eighteen in the second, and fourteen in the third. The 1st class Student, who was remanded from the previous Session, was declared qualified as an Assistant Apothecary ; but at the same time the Government Examiners remarked that he had "passed with difficulty." The reports on the 2nd and 3rd classes of the 2nd Department are decidedly unsatisfactory ; Mr. Smith observes, "eleven Students of the 2nd and six of the 3rd class have done fairly, whilst seven of the 2nd and six of the 3rd, nearly one-half of the whole number of Students, have been reported as more or less deficient." The Principal recommends that three of the young men be removed from the service, as unlikely ever to prove useful Medical Subordinates, and that twelve be remanded. Complaint is made of the disadvantage at which the 2nd Department is placed by the defective preliminary education of its members.

6. The Junior Department, intended to qualify for Hospital Assistantships, contained 93 youths, divided into three classes ; of these 27, constituting the 1st class, were passed by the Government Examiners. The Principal and the Professors consider the material of the Junior Department to be very inferior ; and the Examining Committee, speaking of the 1st class, though they praise rather highly a few of the lads, say of the rest that they "acquitted themselves but indifferently."

7. The Government Examiners found the 1st class of the Junior Department generally ignorant of Vaccination, and they recommend that each Student before his final examination, should be required to obtain from the Superintendent of Vaccination a certificate of qualification in that branch of Medicine. They also repeat the recommendation given in former years, that the members of the 2nd and Junior Departments should be attached to Hospitals before being allowed to join the College. With regard to the former recommendation, it is to be noticed that before the Principal forwarded his Annual Report, the past Students of the Junior Department

had obtained certificates of qualification from the Superintendent of Vaccination. The latter proposal is at this moment under the consideration of Government.

8. Mr. Smith recommends four Students of the Junior Department to be discharged from the Service, and seven others to be remanded.

9. The Johnstone Medal was not awarded, as it did not seem that sufficient merit had been shown to constitute valid claim for the honor. The Government Medal for the Junior Department was given to M. Cathirvelu, who is spoken of in favourable terms. It appears, however, that the award was made with some hesitation.

10. Since the date of the last Report, sanction has been given for the enlargement and improvement of the College building. Mr. Smith observes, that when the building has been completed according to the plan approved by Government, and the adjoining ground has been appropriately laid out, the College "will form an ornament to Madras and an appropriate neighbour to its noble Clinical Hospital."

11. The conduct of the Students during the Session appears to have been generally correct.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed) E. B. POWELL,

Director of Public Instruction.

OFFICE OF THE DIRECTOR OF PUBLIC INSTRUCTION, }
7th June, 1864. }

Annual Report of the Madras Medical College, 1863-64.

1. The Session.

The Session which comes to a close this day, commenced on the 1st September last.

Since the date of last report (May 26th, 1863), several changes have taken place in the College

2. Changes in the College Staff, &c.

* G. O. G. 9th October 1863.

† G. O. G. 6th October 1863.

Staff. On the 10th of October last, Mr. Mayer was succeeded as Principal by Dr. Smith,* and as Professor of Chemistry (officiating), by Dr. Wyndowe.† Mr. Mayer's connection with the College, a connection extending over 13 years, finally ceased on

the 15th of January last, the date on which Dr. Wyndowe was con-

firmed in the appointment. A successful teacher of Chemical Science, a kind and urbane fellow labourer and Principal, Mr. Mayer ever took a deep interest in the welfare of this Institution, and showed himself, at all times, a consistent advocate of its progress and development.

By an order dated 9th September 1863,* Government decided upon separating the Professorship of Midwifery from that of Diseases of the Eye. This order was carried into effect

* No. 225.

upon the 11th of January last, on which day Dr. Aitken, the Superintendent of the Lying-in-Hospital, was nominated Professor of Midwifery and Diseases of Women and Children. More recently, Dr. Aitken having obtained leave to proceed to Europe for six months, Dr. Paul has been gazetted to act as Professor of Midwifery during his absence. (G. O. dated 13th May 1864).

Agreeably to G. O. G., dated 7th November 1862, Dr. Urquhart resumed his duties at the beginning of the Session, as Professor of Medical Jurisprudence and Hygiene.

With one exception, no changes have taken place among the Assistants to the Professors. On the 1st of September last, Second Dresser M. Jaganatha Naidoo resigned his appointment as Native Assistant; he had been connected with the Institution since the 1st of August 1856. Second Dresser E. Ailsworth, No. 376, the Senior Government Medallist, having been nominated to the vacant post, joined the College on the 1st of February last. During the interval, the duties were carried on by Mr. Wood, the Senior Assistant.

3. Constitution of the Departments and classes at the commencement of the Session. There are three Departments in the Medical College, called respectively, the Senior, Second, and Junior Departments.

At the commencement of the Session, the *Senior Department* consisted of—

1 Private Student in his.....	5th year of study.
1 Lane Scholar in his.....	4th do.
2 Government Students in their.....	3rd do.
2 Government Students in their.....	2nd do.
1 Government and 1 Lane Scholar in their 1st	do.

making a total of 8 students in this Department.

Private Student Boalth, having successfully passed his final examination, will receive this day his Diploma, as Graduate of the Medical College.

The *Second Department* consisted of—

First Class Student.....	1
Second Class Students.....	19
Third Class Students.....	16

making a total of 36 Students, of whom First Class Student Fon-
ceca, a remanded Student of last year, having passed his final exam-
ination, will, this day receive his certificate of qualification, as an
Assistant Apothecary.

Two lads resigned the service, one* at the commencement of the
Session, the other† on the 1st of Janu-
ary last. One Student of the Second
Class, J. W. Waldegrave, an excellent
and promising lad, died of cholera on

the 29th of February.

The roll of the Second Department, now stands as follows :

First Class.....	1
Second Class.....	18
Third Class.....	14
Total.....	<u>33</u>

The Junior Department consisted of—

First Class Students.....	29
Second Class Students.....	42
Third Class Students.....	29

making a total of 100 lads.

At present there are 93 Students of the Junior Department on
the College list.

Twenty-seven lads of the Junior Department, constituting the 1st
Class, having been pronounced qualified as 3rd Class Hospital
Assistants by the Final Examination Committee, will receive their
certificates on this occasion.

The following extracts from the Annual Reports of the Professors,
will show the number of Lectures deli-
vered, and of Examinations held by
each Professor, as well as indicate any
special arrangements, as regards tuition,
which may have been adopted during the Session.

The Professor of Medicine reports :—

“ The class met 167 times, including Saturdays, which were ex-
tra days. The Lectures were 155, the recorded examinations 12.
But there have been few days without some examination ; and when
I had managed to ground the class fairly in principles during the
first half of the Session, I made them prepare for each subject by
reading in advance, and taught during the latter half of the Ses-
sion chiefly by questioning and making them reason over the phe-
nomena of each disease ; taking care, of course, to give full expla-
nations wherever they were required. The class has thus gone fairly

through a course of principles and practice of physic, with the exception of skin diseases.

"To Boalth, Evers, and Fonceca, the most advanced Students, I gave instruction in skin diseases."

The Professor of Ophthalmic Medicine reports :—

"During the by-past Session there have been delivered 60 lectures, and 16 examinations have been held during the same period."

The Professor of Midwifery remarks :—

"During the Session, 54 lectures on Midwifery were delivered by Dr. Smith, and 36 on the same subject by me ; and in addition I delivered a course of 31 lectures on the diseases of women and children, making a total of 121 lectures on both subjects.

"During the Session, 24 examinations were held, 12 by Dr. Smith and 12 by me. The examinations were written and oral alternately."

The Professor of Surgery observes :—

"During the Session 1863-64, 94 lectures were delivered and 61 examinations held, making in all 155 meetings. In the first half of the Session, the lectures were given daily, with occasional examinations ; during the latter half the class duties consisted almost entirely of examinations, with conversational expositions on such subjects as were found either not to have been understood or to have been neglected. The lectures during the first half of the Session comprised a complete course of Surgery, so that during the Session 1863-64, the subject which I have the honor to teach, has been gone and such sections a third time, by reading from the text-book, as were thought necessary."

The Professor of Botany and Materia Medica reports :—

"Botany.—Number of lectures, 40 ; Examinations, 12. Materia Medica and Pharmacy.—Number of lectures, 25 ; Examinations, 39.

"The Junior Department class consisted of 40 lads. This class was examined by me every Wednesday."

The Professor of Chemistry reports :—

"The number of lectures given during the past Session has been 120, the number of registered examinations 44 ; of these 4 were written."

The Professor of Anatomy and Physiology reports :—

"I have delivered one hundred and forty (140) lectures, each of one hour's duration. One hundred (100) of these were Anatomical, including the minute or Physiological Anatomy of the organs and tissues. The remaining forty (40) lectures were purely Physiological.

"On the one hundred and fifty eight (158) working days which the Session has comprised, I have devoted a second hour to the tuition of the first and second year's students of the Senior Department, and the first year's students of the Second Department. Fifty hours were thus occupied, in offering additional explanation of the more difficult points in Anatomy, and the remaining one hundred and eight (108) hours were devoted to examinations.

"In addition to this, demonstrations have, very frequently been given in the Dissecting room, both by my Assistant and by myself. The usual Saturday's leisure has frequently been interfered with by attendance in the Dissecting room; and I have availed myself of the same for the purpose of giving a few Microscopical demonstrations, illustrating the structure of organs and the circulation of the blood.

"Senior Department. I have examined the third year's students twenty-five (25) times, and the result of eighteen (18) of these examinations have been recorded.

"The second and first year's students have been examined by me one hundred and eight (108) times. The result of eighteen (18) Examinations of the second year's students, and of forty-seven (47) examinations of the first year's students, have been recorded.

"Second Department.—The students of the second year have been examined twenty-five (25) times, and the results recorded eighteen (18) times. The students of the first year have been present at one hundred and eight (108) examinations, and the results of forty-seven (47) of these have been recorded.

"Junior Department.—I have examined the forty (40) students in the Anatomical class of this department sixteen (16) times, and have recorded the results of fifteen (15) of these examinations."

The Professor of Medical Jurisprudence, &c. reports:—

"The course of Medical Jurisprudence this Session has consisted of 82 lectures and 12 examinations."

From the extracts just read, a correct idea may be formed of the amount of labour which falls to the lot of each Professor, exclusive of any clinical duties he may have to perform; of the system and spirit in which that work is carried on, and of the fidelity with which the orders of Government, as regards examination, are acted upon. Extra labour is voluntarily and most willingly undertaken, whenever the interests of the students, or of the public service, seem to demand it.

Beyond those alluded to in the foregoing extracts, no special arrangements for tuition have been adopted during last Session; it may however be noted, in this place, that such lads of the Second and Junior departments, as were reported to be specially deficient, whether from incapacity or from want of industry, were detained

in College, two hours daily, for six weeks before the close of the Session, in order that they might have an opportunity of studying again, and under favorable circumstances, the several subjects in which they had been found deficient.

Senior Department.

5. Referring to the Senior Department, Professor Blacklock remarks :—

"W. H. Boalth has been most industrious during this Session. His attainments in Medicine are all that can be desired at his time of life, and he is certain to be in every respect an honor to the College.

"B. Evers has made very good progress.

"C. Chinnapoo has made excellent use of his time and opportunities and possesses a good knowledge of medicine after only one year's study. He is intelligent and very enquiring, always examining and judging for himself, and never hesitating to state his difficulties to those who can afford him information."

"S. W. Sithambrum Pillay is well-informed for his period of study ; and, like the rest of the Senior Department, has afforded me every satisfaction by his zeal and application."

Professor Montgomery reports :—

"Therapeutics and Pharmacy.—The students of the Senior Department, under instruction in these branches, were two in number, Gnanamoottoo and Pursuramen. Of these young men I reported last year, that they did not appear to me to be likely to succeed eventually to any high distinction in their profession. I regret to add that the experience of another Session confirms my previously expressed opinion, and I must add, that their acquirements now, are not as good for two years of study, as they were on the former occasion for one year. I can only record their industry as fair and indifferent respectively. Their general intelligence is only of the same unsatisfactory kind.

"On the occasion of a written examination I found Pursuramen's exercise full of gross mistakes, both literary and professional.

"Botany.—Two students, Gregory and Danacooty, are both industrious and intelligent."

Professor Chipperfield remarks :—

"Third year's Students Chinnapoo and Sithambrum Pillay are very intelligent and industrious students. It is a source of pleasure to me to be able to record my satisfaction at the great desire to learn which they both evince, and at the attainments they have already achieved. Chinnapoo appears to me to be especially apt in appreciating the relations between Anatomy and Surgery, Physiology and Medicine ; and thus he has a facility in bringing the facts and theories which he hears in the lecture room to bear upon the phenomena and practice he witnesses in Hospital.

"Second year's Students, Gnanamoottoo Pillay and Pursuramen Naick, I much regret to say, do not evince any great progress in knowledge of the subject which I teach. The places they hold amongst the Students of the Second Department are not those which should be occupied by Matriculated Students of the Madras University.

"First year's Students Gregory and Danacooty Rajoo, are intelligent, well-informed young men, and they evince a great desire to distinguish themselves. Gregory is above Danacooty Rajoo according to the general results of the recorded examinations. At the commencement of the Session they were placed at the bottom of the class, but they speedily made their way up to the highest places ; which they have maintained throughout the Session ; a result not surprising when the superiority of the preliminary education which they have received over that of the Military Students, with whom they are classed, is taken into consideration."

These extracts embody very accurately the experience of the Professors as a whole.

The conduct of these lads has been excellent, and with two exceptions, their zeal, industry, and general intelligence have been well reported of.

Private Student Boalth, an industrious Student, though kept back somewhat by defective preliminary education, has passed his final examination successfully. The Examination Committee report of him as follows :—

"Mr. Boalth who has had a course of five years' tuition, passed a fair examination.

"In the oral examination upon Medicine, Mr. Boalth acquitted himself very creditably, and his written answers upon Medicine and Surgery were very good. On all other points he displayed only an average amount of knowledge.

Lane Scholar Evers, is an industrious, pains-taking young man, who has made good progress during the present Session ; what he wants in quickness, he is likely to make up in industry. At the annual class examinations, he acquitted himself very creditably in Surgery, Medicine, Midwifery, and Diseases of the Eye."

Government Student Chinnapoo has a high character as an intelligent and zealous Student. He stands well in the estimation of his teachers. The annual class examination report testifies to his proficiency in Anatomy and Surgery, while it shows the necessity of his devoting more attention to Physiology and Medicine.

Government Student Seethambrum is a well-informed, industrious Student ; scarcely equal to Chinnapoo in intelligence and quickness ; he is not inferior to him either in industry or zeal. In the annual class examination return, his proficiency in Surgery stands higher than that in Medicine, whilst in Anatomy and Physiology, there is need shown of further study.

Stipendiary Student Pursuramen is alluded to by his teachers in

a tone of disappointment. The annual class examinations prove that in Chemistry and Materia Medica, this Student has made good progress, whilst in Anatomy and Physiology, his acquirements fall short of the mark.

Stipendiary Student Gnanamootoo is spoken of as a somewhat intelligent lad, deficient in industry and irregular in his attendance upon lectures. A return very similar to that already given in the case of the preceding Student, appears in the report of the annual class Examination Committees on this Student Gnanamootoo.

Both Pursuramen and Gnanamootoo passed indifferent examinations. It is to be hoped that this public notice of their deficiencies, may be the means of stirring them up to greater zeal and regularity for the future.

Stipendiary Student Gregory and Lane Scholar Danacooty Rajoo have secured the high approbation of their teachers, as intelligent, well-informed, hard working Students. At the annual class examinations Stipendiary Student Gregory is reported to have passed a "very good" oral examination in Chemistry and Botany, as well as a written one in Anatomy and Chemistry; in Anatomy and Physiology he passed a "good" oral examination; and a "good" written one in Botany. Danacooty passed a "very good" oral examination in Chemistry and Botany, a "very good" written examination in Anatomy and Botany, a "good" oral examination in Anatomy and Physiology, and a "good" written examination in Chemistry.

6. One or two extracts will convey a fair idea of the opinion which the Professors generally entertain of the progress, industry, capacity and conduct of the lads in this department.

Professor Blacklock, speaking of the second year's Students, remarks:—

"The Military Students named in the margin* have all improved considerably during the Session. They have not made nearly so much progress as I desired; but they have, in common with the rest of the class, had considerable disadvantages to overcome; the remaining portion of the class has made but little progress. The industry of Gibson and Rath has been good, that of Dodd, Francis, Lurshay and Downing has been just fair. G. W. Eate's industry has been indifferent, and he could have done much better had he been less idly inclined. Fandlaven is also of an idle disposition; and Hewitt has been exceedingly careless, and seems to me to be too stupid to learn practice of physic. His conduct, however, is undeniably

- * E. O. Doyle.
- S. M. Tyrrell.
- H. R. Rainford.
- T. B. G. Hesterlow.
- J. J. Goggan.
- S. T. Jones.
- C. A. Hellein.
- S. W. Watts.
- A. J. J. Jansen.

- + H. Gibson.
- J. T. Dodd.
- J. Rath.
- M. A. Francis.
- A. F. Lurshay.
- J. C. Fandlaven.
- J. Hewitt.
- G. W. Eate.
- M. Downing.

good, as is that of all the Students except Dodd, Downing and Watts, who have been at times rather difficult to manage ; of late, however, these three have behaved in a very satisfactory manner. Taking the class as a whole, its good behaviour has been equal, if not superior, to that of any class I have had to manage during the last thirteen years."

Clinical Medicine.

The young men of the Military Department in the 2nd year at College and first in Medicine have laboured under great disadvantages this year ; from not having had preliminary Hospital experience as candidates, and also from not having Senior Military Students to assist in their instruction. Every thing in Hospital has been new and strange to them, and when they began to receive Clinical instruction, it was hard to find a way to teach them, as they had never heard or read a word about disease.

Professor Paul, alluding to the same class of the second department reports :—

"Of the second department I cannot speak so favorably. With very few exceptions, the members composing this class are remarkably ill-educated, with vague notions regarding most subjects, even those of every day life and occurrence. They are indifferent by nature, and indolent by habit, so that but few have any desire to acquire knowledge, still less exact and precise knowledge. Most of the youths in this department are mere school boys, who ought to be engaged in the elements of general education, instead of Students struggling with a scientific subject. It is not only in the mere elements of reading, writing, English composition, &c., that their deficiency consists ; they are ignorant of matters of every day life, and show no desire to be enlightened.

"On the whole, however, the class has made as satisfactory progress as in former years, and as the materials of which it is composed would lead us to expect."

As the remarks of Professors Blacklock and Paul may be taken as a fair representation of the general opinions of the Professors, as regards the second department, now in College, it appears expedient to speak somewhat more in detail, of the qualifications of the several classes of this department, as well as of the state of the department as a whole.

Fonceca, a remanded Student of last year, the only Student of the 1st class, has been passed for the grade of Assistant Apothecary, by the final Examination Committee. In their Report on this Candidate, the Committee observe :—

"Senior Apprentice Fonceca, who failed to pass the Examination last year, was permitted, as an indulgence, to remain at College for another year. This Student passed with difficulty."

In the second class are eighteen Students. Of these, four may be regarded as "deficient," namely, Rath, Downing, Watts and Ellis; and three as "specially deficient," namely, Lurshay, Jansen, and Hewitt. Eleven Students of this class have done fairly, among whom Tyrrell, Doyle, Gibson, Hesterlow, Dodd, and Rainsford, may be noted as having made most progress, the remainder having only attained to respectable mediocrity.

In the third class are fourteen Students. Of these, D'Santos, Miles, Garratty, Frederick, Gooroosawmy, and Solomon, have been pronounced "deficient," and two, namely, O'Brien and Lacey "specially deficient;" the remaining six lads of the class have made good progress during the Session.

These results have been arrived at from an examination of the Tabular Class Reports furnished to the Principal by each Professor, from the Annual Class Examination Reports, and from repeated personal experience and observation of the state of the classes referred to. Of these several sources, the most trustworthy, perhaps, is that of the Professor's Tabular Reports, for obvious reasons. The more formal and formidable character of the Annual Class Examinations, the novelty in the style of questioning, the selection, it may be, of unexpected subjects of examination, make the lads timid, hesitating, and nervous, and the frequent result is, that they fall short of the standard at which they had been placed, and properly placed by their teachers.

Eleven Students of the 2nd and six of the 3rd class have done fairly, whilst seven of the 2nd, and six of the 3rd class, nearly one-half of the whole number of the Students, have been reported as more or less deficient. This result, it must be confessed, is far from satisfactory.

Of the Students of this department, as a whole, there is much to be said. Quiet, well conducted, orderly lads, they attend College with great regularity, and give no trouble. Many of them are very young, some of them perfect boys, not a few of them are ill fed, and most of them have but poor conveniencies for study in their own houses or lodgings; all of them, with few exceptions, suffer from defective preliminary education, and the total absence of all pre-collegiate Hospital training places the whole department at very great disadvantage. The subjects of study, too, are numerous and difficult, the time allowed is too short, and the lads pass on with the stream, for the system of remanding is somewhat open to objection, and the step of severing their connection with the College, is only taken in exceptional and confessedly unpromising cases.

The Principal would solicit the attention of authority to the Appendices of this Report, as forming a striking commentary upon statements already submitted, and, in selecting Mr. Blacklock's Re-

port, he would request attention to the sensible and important suggestions therein contained, suggestions which are in part applicable also to the Junior Department.

It is recommended that Second Department Students, Lurshay, Jansen, and Hewitt, be removed from the Service, as never likely to prove usual Medical Subordinates ; and that Rath, Downing, Watts, Ellis, D'Santos, Miles, Garratty, Frederick, Gooroosammy, Solomon, O'Brien, and Lacey, be remanded.

The Students of the Junior Department are directed in their English studies by Mr. Watkins, the English Teacher, whose devotion to his duties has given great satisfaction.

7. Junior Department. The third class, under his instruction, has passed a fair examination in Writing to Dictation, Arithmetic, Spelling, meanings of words, Geography, and explanation of Medical Terms.

The first and second classes are instructed in the elements of professional knowledge by the College Assistants, who have done as much as could have been expected with such unpromising material.

Alluding to the Junior Department, Dr. Paul observes :—

“ They are very deficient in a knowledge of English, and trust more to their memories than to their understandings for the acquisition of the little surgical knowledge required of them.”

Mr. Chipperfield remarks :—

“ There are a few lads in the anatomical class of the Junior Department, who possess fair intelligence and are very industrious ; but generally speaking, the class is greatly deficient in attainments.

“ Lads educated on the present system are not, and cannot be the substitutes for the “ Dressers” of former days.

“ The senior class, consisting of twenty-seven Students has been passed for the grade of 3rd class Hospital Assistants by the final examination Committee.”

The Committee remark as follows :—

“ Knowing the prescribed course of professional training to which these lads are subjected, we did not look for any high degree of excellence, yet M. Catharavaloo, D. Gnanum, A. Ragavaloo, A. Ruthnasawmy, acquitted themselves very creditably, the rest but indifferently. We were disappointed in finding the class generally so ignorant of Vaccination ; none of them had attended at the Vaccine Depôt. We consider that each Student, before presenting himself for his final examination, should be required to have a certificate from the Superintendent of Vaccination in that branch. We would call attention to the reiterated recommendation in former years, as to the advisability of not only the members of the Second Department, but also those educating to be Hospital Assistants,

being attached to Hospitals for some considerable period, before they are permitted to join the College.

"Attention will be paid in future to the remarks of the Committee on the subject of Vaccination. Since their Report was written, all the passed Students of the Junior Department have received Certificates of qualification from the Superintendent of Vaccination."

The following Students of the Junior Department are recommended for discharge from the service as specially deficient :—

Manicum,	No. 794	} 3rd class.
F. Appavoo,	do. 778	
Rajopillay,	do. 775	
A. Appavoo,	do. 773	

And, it has been considered advisable to remand the following lads

Etherajooloo,	No. 739	} 2nd class.
Francis,	do. 761	
Antic,	do. 757	
Syed Furreed,	do. 731	
Ramanjooloo,	do. 766	
Murridoss,	do. 754	
V. N. Manicum,	do. 737	

8. The Johnstone and Government Medals, Prizes, &c. No special merit has been exhibited to warrant the College in awarding this year the Johnstone Medal.

It was a question with the Council whether, under existing circumstances, it would be advisable to recommend the award of the Government Gold Medal to any lad of the Junior Department, inasmuch, as by so doing, the successful Student would be put on a level with former medalists of corresponding grade, but of much higher qualifications; as, however, the merits of the lad who stands at the top of the 1st class of this Department, Catharavaloo, No. 697, are great, his industry undeniable, and his capacity considerably ahead of that of the class generally, and, as moreover, he has passed a highly creditable final examination, it has been resolved to recommend him for the Government Gold Medal.

A list of the successful candidates for Prizes is given in the Appendix.

Before concluding this part of the Report, the Principal has great pleasure in alluding to the zeal and regularity with which Assistant Apothecary Stewart, of the Civil Dispensary, attached to the General Hospital, attended the College classes during the Session. He also joined the examinations and acquitted himself very creditably.

Seventy-four volumes have been added to the Library during the last year, and a considerable consignment is now on its way from Engluad. A list of the books is given in the Appendix.

Government have authorized the Principal to make arrangements with a London book-seller, for the purchase of Library and Prize books, and have placed at his disposal, the sums annually sanctioned for those objects.

In accordance with the decision of Government, arrangements have been made for the regular supply of Library and Prize books.

10. Museum. A list of the Pathological and other specimens added to the Museum during the past year, amounting to 37, has been placed in the Appendix.

With reference to some delay which has taken place in the "putting up" of the Pathological specimens for the museum, Professor Chipperfield makes the following remarks; "Mr. Wilkins, the Demonstrator of Anatomy and Curator of the Museum, continues to render all the aid it is in his power to give, but this has been much curtailed, since he has had to instruct the pupils of the Junior Department, which he does in the most efficient manner. I am sorry to say that this occupation of his time has also had the effect of very much delaying the putting up of the Pathological specimens, which are added to our Museum, of which there is now a considerable accumulation."

The labours connected with the tuition of the Junior Department which, since 1861, have been imposed on the College Assistants, materially interfere with the time which ought to be devoted to their duties as Assistants to the Professors. Professors Montgomery and Wyndowe agree with Mr. Chipperfield in desiring that their Assistants should be relieved from all duties extra to those of their special departments. In the event of certain changes taking place, which are foreshadowed by the sanction recently given to the enlargement of the College building, this question will come to be considered, under circumstances more conducive to a correct decision than at present.

11. Assistants and Prosecutors.

Messrs. J. J. Wood.

" R. Wilkins.

" E. Ailsworth.

" R. Harvey.

A list of the Assistants and Prosecutors of the College is entered in the margin.

Messrs. Wood, Wilkins and Harvey continue to merit the unqualified approbation of their respective superiors.

Prosecutors, &c.

B. Evers.

C. Chinnapoo.

S. W. Sithambaram.

E. O. Doyle.

M. Catheravalloo.

H. Gibson.

S. M. Tyrrell.

Mr. Wood is Assistant to the Professor of Botany and Materia Medica, with charge of the Botanical and Materia Medica Museum. As Senior Assistant also, his aid is required by the Principal in the general direction of Subordinate College details. In addition to these duties, he is teacher of Surgery in the

Junior Department. During the past Session, he has delivered 124 lectures to the 1st class of the Junior Department, and has held 51 examinations. He has also lectured to the 2nd class 107 times on *Materia Medica*, and has held 31 examinations.

Mr. Wilkins is Assistant to the Professor of Anatomy and Physiology, and Curator of the Museum. He is attached also to the 2nd class of the Junior Department, as teacher of Anatomy and Physiology, having delivered 155 lectures and held 23 examinations during the past Session.

Mr. Harvey is Assistant to the Professor of Chemistry, and in charge of the Laboratory. In addition to these duties, he teaches Medicine to the 1st class Students of the Junior Department. He held 31 examinations and delivered 126 lectures during the past year.

E. Ailsworth, the Native Assistant, has taken but little part in teaching this Session, but will conduct the instruction of the Junior Department in *Materia Medica*, next year.

To Mr. Watkins, the English teacher, and his merits, allusion has already been made.

The conduct, zeal, and industry of the Assistants have been most commendable, and the assistance rendered by them, in conducting the laborious duties of teaching, has been most valuable.

The Prosecutors have acquitted themselves creditably ; some alteration in the College arrangements, as regards these temporary Assistants, seems advisable.

The other servants of the College have given satisfaction.

Since last report, Government have sanctioned the enlargement and improvement of the College building.

12. Final Remarks.

G. O. No. 14, dated 16th January 1864.

The plan, which has been approved of, provides for the wants of the Institution, as regards space and arrangement. When the proposed additions to the building shall have been completed, and the adjoining ground properly laid out and effectually "conserved," the Medical College will form an ornament to Madras, and an appropriate neighbour to its noble Clinical Hospital.

Government have given an important decision lately, as regards the privilege of granting diplomas hitherto enjoyed by this Institution. In withdrawing that privilege, consequent upon the establishment of the Madras University, the Government have ruled, that Students of the Senior Department, now under instruction, shall be permitted to claim the College diploma on passing successfully their final Examination, but that new entrants shall be required to conform to the University examinations for Degrees in Medicine.

The order is as follows ;

“His Excellency the Governor in Council authorizes the Principal of the Medical College to issue the Diploma of the College to Mr. Boalth, and any other Students now in the Senior Department, who may pass the prescribed examination.

“2. No future Students will be granted Diplomas by the College ; all who wish to obtain Academic degrees, must pass the University Examination in the Faculty of Medicine.”

Taking into consideration the want of demonstrative apparatus in the Department of the Professor of Midwifery, the Government have sanctioned an expenditure, by Dr. Aitken, when in England, if not more than £150, in the purchase of the necessary instruments, apparatus, &c.

Referring to this decision, Professor Aitken remarks :—

“The liberality of Government will now, however, place this branch in a much more satisfactory position in this respect than it has ever yet enjoyed, and I feel assured that when the apparatus which is about to be procured has been made available, in conjunction with the practical advantages of the Lying-in-Hospital, no other School of Medicine will possess the means of giving a more thoroughly useful and practical education on this particular branch of Medical knowledge.”

Certain suggestions have been made, during the Session, regarding Hospital attendance, hours of lecture, dissecting-room arrangements and final examinations, which in due time will form the subject of separate communications.

In concluding his Report, which, in accordance with orders, has been confined mainly to a history of the progress of the College during the last year, the Principal would acknowledge, with satisfaction, the ready support and co-operation which he has at all times received from his brother-Professors.

To them, individually, it may be of little moment that, from repeated personal observation, he can certify to the zeal and devotion manifested in their labors ; but to himself it is a matter of duty no less than of pleasure, to bear public testimony to the conscientious and able manner in which they conduct the responsible duties of this Institution.

GEORGE SMITH, M.D.,

Principal.

Proceedings of a Committee of Examination of the Students of the Madras Medical College, assembled agreeably to orders of Government.

PRESIDENT.

J. Shaw, Esquire, Deputy Inspector-General of Hospitals.

MEMBERS.

D. Macfarlane, M.D., Garrison Surgeon.

J. Donaldson, M.D., Surgeon, 2nd District.

One Student from the Senior Department, one a remanded Student from the 2nd Department, and 27 from the Junior Department, appeared before us for their final examination.

Mr. Boalth, who has had a course of five years' tuition, passed a fair examination.

In the oral examination upon Medicine, Mr. Boalth acquitted himself very creditably, and his written answers upon Medicine and Surgery were very good. On all other points he displayed only an average amount of knowledge.

Senior Apprentice Fonceca, who failed to pass the examination last year, was permitted, as an indulgence, to remain at College for another year. This Student passed with difficulty. We beg to observe that we do not consider the system of remanding a good one. If a Student, from idleness or inaptitude for study, has failed to pass the final examination, it is, we think, better for the public, and his own interests, that he be removed at once.

Twenty-seven lads from the senior class of the Junior Department presented themselves for examination.

Knowing the prescribed course of professional training to which these lads are subjected, we did not look for any high degree of excellence, yet M. Catheravaloo, D. Gnanum, A. Rajavaloo, A. Ruthnasawmy, acquitted themselves very creditably, the rest but indifferently. We were disappointed in finding the class generally so ignorant of Vaccination, none of them had attended at the Vaccine Dépôt. We consider that each Student before presenting himself for his final examination should be required to have a certificate from the Superintendent of Vaccination in that branch.

We would call attention to the reiterated recommendations in former years as to the advisability of not only the members of the 2nd Department, but also those educating to be Hospital Assistants, being attached to Hospitals for some considerable period before they are permitted to join the College.

(Signed) J. Shaw, Depy. Inspector-Genl. of Hospitals—*President.*

(„)	D. Macfarlane, M.D., Garrison Surgeon,	} <i>Members.</i>
(„)	J. Donaldson, M.D., Surgeon, 2nd District,	

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- 2.—Churchill on Diseases of Women, (5th Edition.)... Fannin & Co., Dublin
- 3.—Report on Public Instruction, Madras Presidency..... Graves, Cookson & Co.
- 4.—Dr. Donaldson on Epidemic Cholera..... Gantz Brothers.
- 5.—Govt. Report on Vaccination for 1863..... Graves, Cookson & Co.
- 6.—Report on Madras Medical College for 1863-64... Government Press.
- 7.—Annals of Military and Naval Surgery..... J. Churchill, London.
- 8.—I. C. L. Marsh, M.D., on Special Therapeutics..... R. Hardwicke, London.
- 9.—Acclimatization Society, (4th Annual Report.)
- 10.—J. Fayer, M.D., on Amputation at Hip Joint..... Military Orphan Press, Calcutta.
- 11.—Ewart's Review of the treatment of Tropical Diseases Part I } Lepage,
Do. do. do. do. Part II } Calcutta.
- 12.—J. Peet, M.D., on the Principles and Practice of Medicine..... Thacker, Vining & Co., Bombay.
- 13.—Stewart Clark on the Hygiene of the Army in India..... Smith, Elder & Co., London.

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| The Dublin Medical Press. <i>Standard</i> | The do. Journal of the Medical Sciences. |
| The Dental Review. <i>H</i> | The do. Medical Times. <i>✓</i> |
| The Dublin Quarterly Journal of Medical Science. <i>Standard</i> | Transactions of Bombay Medical and Physical Society. <i>✓</i> |
| The North American Médico-Chirurgical Review. <i>Traveller</i> | The Pharmaceutical Journal. |
| The American Journal of Science and Arts. <i>Standard</i> | The Stethoscope. |
| Braithwaite's Retrospect. | The Canada Lancet. |
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| The Medical Critic and Psychological Journal. <i>H</i> | Transactions of the Epidemiological Society of London. |
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